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THE ROAD TO COP27

27 Steps to Net Zero



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How to contact us

Editor

Lucy Fitzgeorge-Parker
lucy@responsible-investor.com,
+44 7595 727780

Deputy Editor

Elza Holmstedt-Pell
elza@responsible-investor.com

Head of Special Projects

Graeme Kerr
graeme.k@peimedia.com, +44 20 3862 7491

Special Projects Editor

Ben Payton
ben.p@peimedia.com, +44 7746 299047

Senior Reporters

Khalid Azizuddin
khalid@responsible-investor.com,
+44 20 3148 6596

Paul Verney

paul@responsible-investor.com,
+44 20 3307 2472

Reporters

Gina Gambetta
gina@responsible-investor.com,
+44 7375 099779

Dominic Webb

dominic@responsible-investor.com,
+44 20 3307 2457

Junior Reporter

Fiona McNally
fiona@responsible-investor.com,
+44 7442 018029

**Contributors Steve Cotterill, Evie Rusman,
Matt Smith, Mina Tümay**

Managing Editor, Production: Mike Simlett

Production Manager: David Sharman

**Senior Production Editors: Tim Kimber,
Adam Koppeser**

**Production Editors: Nicholas Manderson,
Jeff Perlah**

**Copy Editors: Helen Burch, Eric Fish,
Khai Ojehomon**

Art Director: Mike Scorer

Head of Design: Miriam Vysna

Art Director - Americas: Allison Brown

**Senior Designers: Denise Berjak, Lee Southey,
Rebecca Worrell**

Designer: Ellie Dowsett

Director, Global Business Development

Claire Porter claire@responsible-investor.com

Global Marketing Solutions Manager

Henry Wright henry@responsible-investor.com

Subscriptions and Reprints

subscriptions@peimedia.com

Customer Services

customerservices@peimedia.com

Editorial Director, US: Rich Melville

Editorial Director: Philip Borel

Director, Product: Amanda Janis

Director of Research and Analytics: Dan Gunner

Operations Director: Colm Gilmore

Managing Director, Asia: Chris Petersen

Chief Commercial Officer: Paul McLean

Chief Executive Officer: Tim McLoughlin



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The Road to COP27

NOVEMBER 2022

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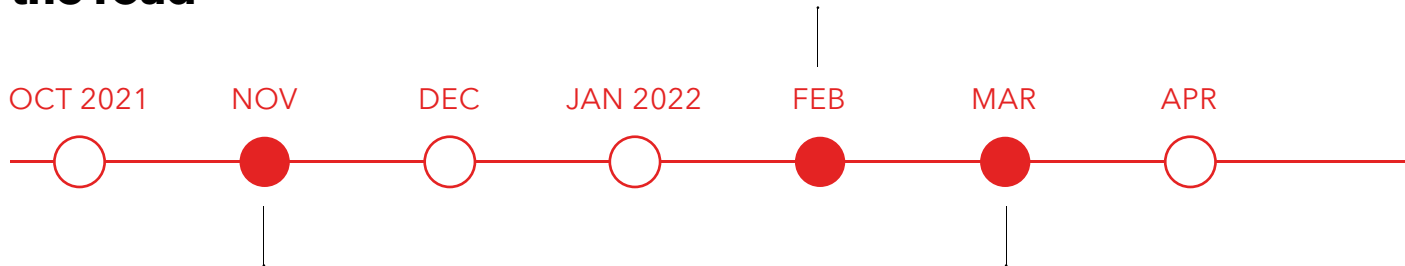
From COP26 to 27

Between Glasgow and Sharm el-Sheikh, financial actors have continued to commit to net zero, but the energy security crisis and growing polarisation over ESG have been bumps in the road



IPCC report warns of irreversible impacts

The Intergovernmental Panel on Climate Change’s latest report warned that many of the impacts of climate change are already irreversible. The study found that many species of trees and corals are suffering mass mortality from extreme weather events and that 40 percent of the world’s population are “highly vulnerable” to climate impacts. The IPCC concluded that “any further delay in concerted global action will miss a brief and rapidly closing window to secure a liveable future”.



COP26 produces Glasgow Climate Pact

COP26 concluded with the signing of the Glasgow Climate Pact by 197 countries. Signatories agreed to pledge further cuts to emissions in 2022 in order to keep the goal of limiting temperature rises to 1.5 degrees Celsius within reach. Meanwhile, financial actors controlling \$130 trillion pledged to back clean technology. However, a commitment on coal was watered down, with China and India insisting that a clause on ‘phasing out’ coal be replaced with a commitment to ‘phase out’ use of the fuel.



UN chief warns Ukraine war threatens climate goal

UN Secretary-General Antonio Guterres warned an ‘all of the above’ strategy to replace Russian gas in the aftermath of Vladimir Putin’s invasion of Ukraine risked creating long-term dependencies that would lock in higher levels of emissions. However, an EU plan published in May put greater emphasis on saving energy and accelerating investments in wind, solar and other green energy infrastructure.

NZAM membership reaches 273 asset managers

The Net Zero Asset Managers initiative's disclosure report revealed that 53 new asset managers have committed to the initiative, bringing total membership to 273. The NZAM members have \$61 trillion in AUM, of which \$16 trillion is committed to be managed in line with net-zero objectives. Of the NZAM membership, 83 asset managers have disclosed their initial targets. NZAM noted that many different approaches for setting targets are available. The initiative has so far endorsed three of these methodologies.

US faces 'balkanisation of finance': report

A report commissioned by the Principles for Responsible Investment warned that anti-ESG policies being adopted by several Republican-controlled states in the US risk creating a 'balkanisation' of the financial system. The report stated asset managers that adopt net-zero-aligned strategies and avoid fossil fuel investment face missing out on investments from state retirement systems.



MAY

JUN

JUL

AUG

SEP

OCT

NOV

GFANZ releases guidance on transition plans

The Glasgow Financial Alliance for Net Zero released a set of draft recommendations for financial institutions on developing net-zero transition plans. The recommended steps cover the setting of targets and milestones as a part of the roadmap to net zero, along with strategies for implementation and engagement. GFANZ also recommends the inclusion of defined metrics in the transition plan, and calls for financial institutions to define the roles and responsibilities of board members and senior managers in achieving net-zero targets.



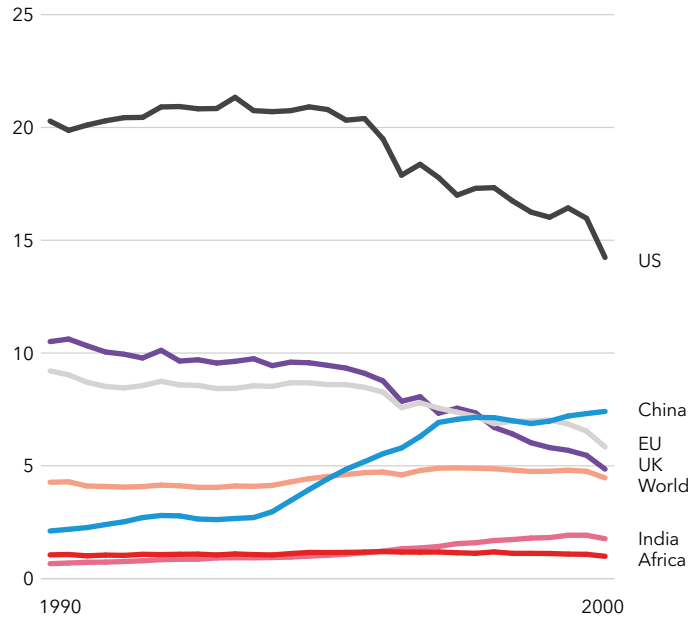
COP27 kicks off in Sharm el-Sheikh

Delegates will convene in the Egyptian resort from 6-18 November. *Responsible Investor* reported in October that financial sector participation in Sharm el-Sheikh is likely to be lower than in Glasgow. This reflects concerns over Egypt's human rights record, as well as the optics of jetting into a Red Sea resort. COP27 is likely to focus on the implementation of existing targets, rather than producing major new agreements. Egypt says around 90 heads of state are expected to attend.

An uneven picture

The United States continues to account for a disproportionate share of global emissions - though China is catching up

CO2 emissions per capita vary widely around the world (tonnes)



World's top five emitters, 2020 (tonnes)



Source: Our World in Data based on the Global Carbon Project, 2020

27%

China's share of global CO2 emissions in 2020

53%

The increase in global CO2 emissions between 1990 and 2020

49

Tonnes of CO2 emissions per capita in Qatar, the world's most carbon-intensive economy

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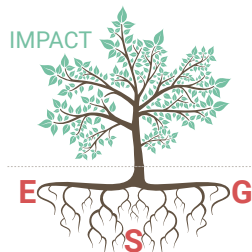
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Editor's letter

Ben Payton

ben.p@peimedia.com



Time for action as climate disaster looms

Time is running out. As political and business leaders from around the world descend on Sharm el-Sheikh for the COP27 summit, they can hardly ignore the mounting evidence that the world is sliding into the abyss of climate catastrophe.

Efforts to limit global temperature increases to 1.5 degrees Celsius have almost run out of runway. Even keeping the rise in temperatures to 2 degrees looks like an increasingly tall order. Decisive action is needed now to prevent the worst effects of climate breakdown – before it's too late.

That's why we decided to produce a list of 27 Steps to Net Zero for investors to consider. We look at some measures, such as investing in renewable energy, that are widely accepted as essential for decarbonising the global economy. But we also look at ideas that are subject to intense debate. Should we invest in carbon capture? Should nuclear be part of the transition? Is there a place for carbon credits?

There are no easy answers to many of the dilemmas that investors face as they seek to reposition their portfolios for a net-zero future. Indeed, the whole concept of considering ESG factors in investment decisions has come under attack from conservatives in the US over the past year.

The world has changed immensely since COP26 in Glasgow. But there is no doubt that the global financial system will have a crucial role in determining whether the world can reach net zero. We hope that this special report is helpful in charting the roadmap for the journey ahead.

Ben Payton



New York
130 West 42nd Street
Suite 450
New York
NY 10036
T: +1 212 633 1919

London
100 Wood Street
London
EC2V 7AN
T: +44 20 7566 5444

Hong Kong
Room 1501-2, Level 15,
Nexus Building,
No. 41 Connaught Road, Central,
Hong Kong
T: +852 2153 3240

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A year of climate crises

Devastating droughts, floods and other weather extremes in 2022 have highlighted the growing impacts of climate change



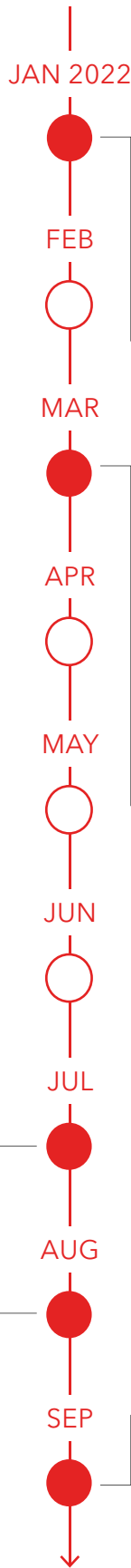
Europe bakes

Temperatures exceeded 40C for the first time in the UK, while the heatwave in France led to an estimated 11,000 deaths. Wildfires raged across the European continent amid drought conditions throughout the summer.

47C
Europe's highest temperature was recorded in Pinhão, Portugal, on 14 July

East African drought puts 22 million at risk

Rains failed for the fourth year in a row in 2022 in East Africa. Some 22 million people are at risk of starvation in countries including Somalia, Ethiopia and Kenya, according to the World Food Programme.



Record heat in Australia

Temperatures hit 50.7C in the town of Onslow in Western Australia on 13 January, equalling the country's highest-ever temperature.

32.5C
The temperature at Banak, a Norwegian town in the Arctic Circle, in June

Heatwave in South Asia damages harvests

Extreme heat arrived unusually early in India and Pakistan this year, with up to 30 percent of the harvest lost in some areas. India also suffered power cuts as a result of massive demand for air conditioning.



Devastating floods hit Pakistan

Monsoon rains and melting glaciers caused the worst floods in Pakistan's history. As much as 10 percent of the country's area was inundated, with damage estimated at \$40 billion.

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KEYNOTE INTERVIEW

Navigating the uncertainty on climate risk



Bloomberg's Edo Schets and Zane Van Dusen discuss climate risk and how to make impactful decisions

The risks posed by climate change become more concerning each year, and investors are looking to understand the impacts of climate risks both on a portfolio and overall sector level. Edo Schets, head of climate products on the sustainable finance solutions team at Bloomberg, and Zane Van Dusen, Bloomberg's global head of risk and investment analytics products, discuss the challenges investors face when it comes to assessing and accounting for climate-related risks.

Q How concerned are investors about the impact of climate change?

Zane Van Dusen: We are seeing that firms are increasingly concerned about

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the potential impact of climate change on their investments. Earlier this year, we surveyed a group of clients and market participants about this topic and found that about 85 percent are already assessing climate risk in some form or are in the process of developing a climate risk framework – which is different from years past. Interestingly, a lot of traditional risk management professionals are involved in the conversation rather than just people in more ESG-specific roles. Climate risk is moving into the mainstream as people recognise the financial impact.

While we found that 'regulations and disclosure' was the largest driver for this development, only 25 percent of respondents indicated it was their primary driver. There was a broad range of reasons for firms to start focusing on climate risk, including internal risk management, performance, and reputation risk, indicating that this is generally not a 'check the box' exercise for most firms.

The only general consensus was that the mandate to assess the impact of climate change on investments and manage that risk is coming from the top within these organisations. This is good news because it means firms are taking climate risk seriously. The bad news is they're taking it seriously because it is a real risk.

Edo Schets: We call it climate risk, but it's two different things. On the one hand, it is the physical effects we're already seeing with wildfires, droughts and floods. Those impacts are already being felt and climate change will make them more frequent and severe. These are known as physical risks. To prevent these events from getting much worse, reducing greenhouse gas emissions is key.

This is where the other aspect of climate risk comes into play, transitioning to a low carbon economy. For example, maybe you're forced by policies to reduce your emissions and you weren't prepared for the associated costs. Our energy research arm, BloombergNEF, shows that the rise of new energy technologies will benefit some companies but can create losses for others, especially those that are heavily exposed to fossil fuels. Investors are faced with the challenge of supporting companies to adapt to these changes, while also hedging their risks. Overall, we're seeing that climate risk is something that investors are certainly thinking about.

Q Is the focus mostly on evaluating risks, or on identifying opportunities?

ZVD: The initial focus appears to be on evaluating risks since there's consensus that climate change could adversely impact investments in the future. However, there's a lot of uncertainty around how significant impacts may be and when they will happen. Firms should focus on stress testing, multi-scenario analysis and considering tail risk, rather than trying to check a box for regulatory purposes or trying to forecast the impacts with false precision. At the same time, firms are beginning to realise they could be missing out on potential opportunities if they exclusively focus on the risks.

ES: The regulatory attention on climate risks enhances the focus on risk, but there are major opportunities for investors who can identify new technologies

that will become commonplace. It's likely that the transition will affect companies within peer groups unevenly. Companies whose business models are adaptable to new technologies and regulations will face smaller transition risks and larger opportunities than companies that are more rigidly tied to carbon-intensive production.

Q What are investors' main challenges in assessing climate risk - and how can these be overcome?

ZVD: Data continues to be the biggest challenge. Investors need to analyse a large web of interconnected data sets like greenhouse gas emissions, geolocation, supply chain info, weather data and forward-looking climate scenarios. These are relatively complex data sets to start with, but they also need to be merged together to produce intuitive and actionable metrics, which is an extremely complex task. And even with the right metrics in place, many firms don't know what to do with them. For example, even if I know how physical risk could affect a company, how much should I invest in mitigating that risk?

A cohesive data strategy is key to overcoming the challenges associated with managing climate risks.

“Climate risk is moving into the mainstream as people recognise the financial impact”

ZANE VAN DUSEN

Bloomberg helps clients get access to complex data sets in a consistent and easy-to-use form so they can integrate that data into their own analysis. However, even with the best data, gaps still exist, as companies are not fully reporting ESG metrics, such as carbon emissions. We also focus on helping clients fill those gaps by using innovative models to produce accurate company-specific estimates for GHG emissions and similar metrics where coverage is critical.

We also recognise that not every client can or wants to build their own model for climate risk; therefore, we are developing our own climate risk models and metrics. Similar to our traditional risk products, we are taking a data-driven approach that combines the latest market data with the latest scientific research to produce ready-to-use climate risk metrics that also reflect the level of uncertainty in this relatively new domain.

Q How will government strategies on climate change impact investors over the next two to five years?

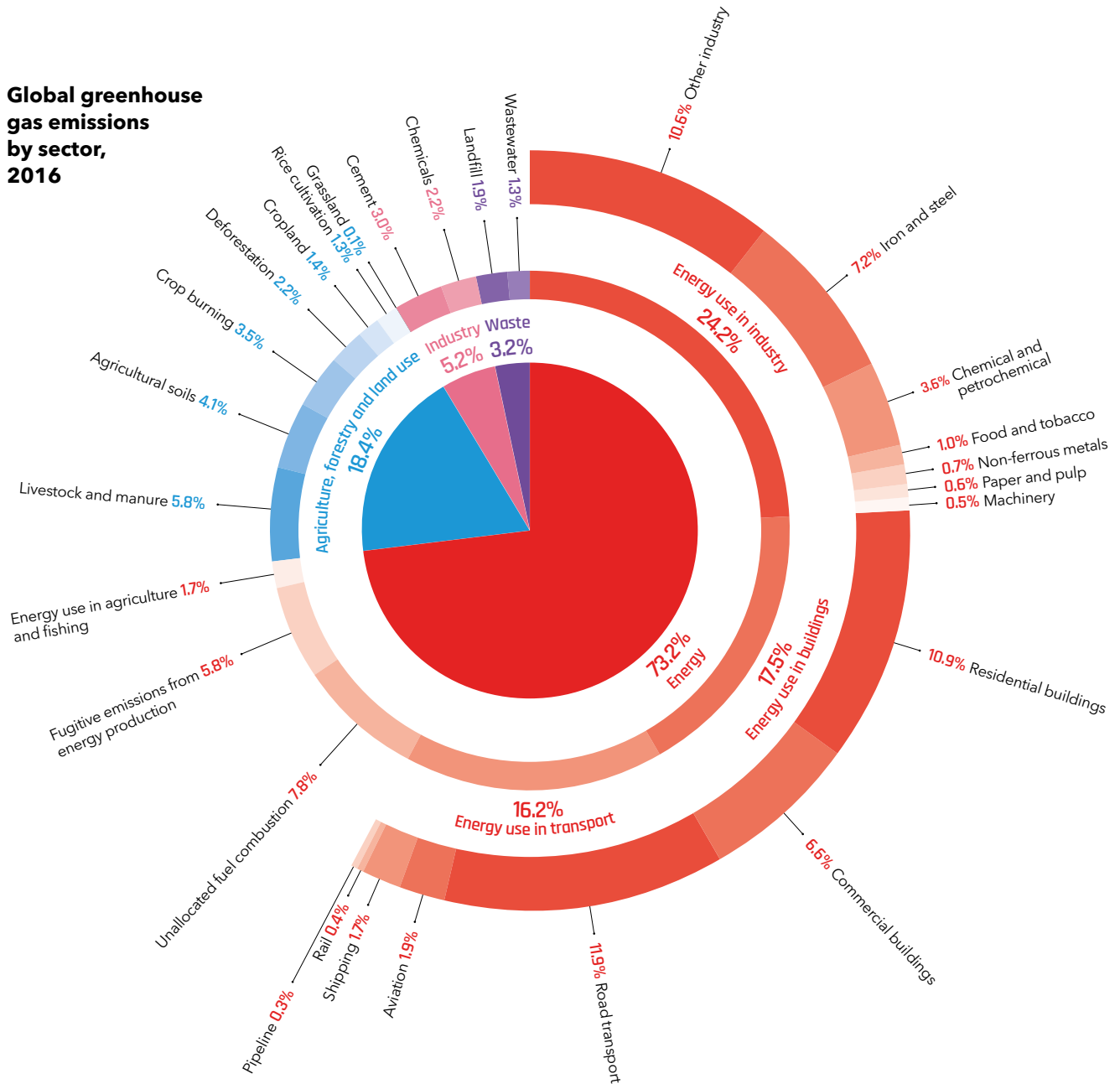
ES: Whether we are looking at transition risk or physical risk, government regulations are a huge factor to consider. For the physical risks, how bad things will get depends on the actions we take today. On the transition risk side, if we are going to act, especially with policies put in place that put a price on carbon emissions, there will be costs.

The next two to five years are going to be crucial if we want to limit the rise in global temperatures to below two degrees. According to the Paris Agreement, global emissions need to be halved by 2030, so this is the decisive decade. Although the role of governments is huge, emissions have to ultimately be reduced by the real economy. The key is for the public and private sectors to come together to help reduce transition risks, through coordinated action. ■

Emissions: sector by sector

Energy use in industry, buildings and transport is driving global emissions, though agriculture also plays a major role in the climate crisis

Global greenhouse gas emissions by sector, 2016



Source: Our World in Data, 2020



THE ROAD TO C O P 2 7

27 Steps to Net Zero

*The measures investors should be thinking about
on the road to a low-carbon future*



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Corporate strategies

Ben Payton asks where investors should begin on the journey to net zero

When we close our eyes and think of a net-zero world, most of us probably see rows of wind turbines spinning above the oceans; landscapes blanketed with solar panels; electric cars humming along the roads. We might imagine ecosystems being restored and protected, and new methods of producing food taking root. We may even believe that people will learn to waste less and share more.

But for all of that to be possible, the global financial system will need to change how it operates. Investors will need to channel capital away from polluting industries and into the technologies and business models that can deliver a greener future.

The first steps on the journey to net zero, therefore, must involve making clear commitments to reducing emissions, over both the long term and short term, and keeping track of progress towards decarbonisation. The build-up to COP26 in Glasgow last year saw a trickle of financial actors that had committed to net zero turn into a flood. At the last count, some 273 firms, collectively managing \$61 trillion in AUM, have now committed to net zero by 2050 and joined the Net Zero Asset Managers initiative.

But, as we explore throughout the following pages, actually turning lofty objectives into measurable progress is easier said than done. A particularly thorny issue is the longstanding question over whether investors should divest from the most polluting industries, or whether it is wiser to engage with companies to steer them towards reducing emissions.

Meanwhile, the financial system is increasingly turning to green bonds and sustainability-linked loans as a means of incentivising progress – although these instruments remain vulnerable to accusations of greenwashing. ■

\$61trn AUM of firms that have joined NZAM and pledged to reach net zero by 2050

90% Share of global GDP covered by net-zero targets

Green finance: hundreds of banks, institutional investors and asset managers have committed to achieving net-zero portfolios. But moving from commitments to action remains a challenge.



1

Make commitments and set targets

Financial actors have been queuing up to promise climate action in recent years. Over 90 percent of global GDP is covered by net-zero targets, while more than 550 firms have joined the Glasgow Financial Alliance for Net Zero and pledged to reach net zero by 2050.

In fact, among the largest banks, asset managers and asset owners headquartered in Europe and North America, it is hard to find institutions that have not made climate commitments of some kind.

But whether the pledges made by investors and corporates are truly credible is another matter. After all, a CEO that promises their firm will achieve net-zero portfolio emissions by 2050 can rest safe in the knowledge that they will have long since retired by the time anyone holds them to account.

Attempts to compel members of GFANZ and its sub-groups to commit to detailed roadmaps towards net zero – and to forego fossil fuel investments – have run into difficulties in recent months. Some financial institutions have reportedly considered leaving GFANZ as a result. Former US vice-president Al Gore warned in September that it has “become apparent that some who made impressive pledges did not immediately begin to put in place a practical plan to fulfil those pledges”.

While long-term pledges are important, outlining a clear path to substantially reduce emissions by 2030 is arguably the key metric for climate credibility. Reducing emissions within the next few years will make more impact in limiting warming than action in the 2030s or 2040s. Board members and management teams, meanwhile, know that they can be held personally accountable for progress towards 2030 targets, in a way that is infeasible with 2050 goals.

2

Collect data and measure emissions

Collecting data on current emissions and then monitoring reductions over time are essential steps for investors seeking a credible path to a net-zero portfolio.

But there is much uncertainty about exactly what should be measured and reported by companies. It is already commonplace in many jurisdictions for companies to report Scope 1 and 2 emissions, which covers emissions in their own operations and emissions generated in producing energy that the company uses. But whether companies can and should also be required to report Scope 3 emissions – the upstream and downstream emissions in their value chains that they are only indirectly responsible for – is much more debatable.

Amid the myriad complexities involved in emissions measurement and management, progress in encouraging listed companies to report their emissions has been limited. MSCI reported in March that fewer than 40 percent of companies in its Investable Market Index reported Scope 1 and 2 emissions, while fewer than 25 percent reported Scope 3 emissions.

Nate Aden, finance sector lead at the Science Based Targets initiative, acknowledges that the wide range of initiatives, metrics and measurement systems can be disorienting for investors that lack experience in climate science. “There’s a lot of confusion and a lack of consistency and clear understanding of how things fit together or what may be more or less credible over time,” he says.

But Aden notes that the desire to perfect data collection and measurement mechanisms cannot be an excuse to delay action. “One of the conversations we have with financial institutions is that the data are imperfect,” he says. “Well, if we waited for the data to be perfect, we’d surpass 3C very quickly. We have to act now.”



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KEYNOTE INTERVIEW

Japan's journey to net zero



Creating a sustainable future through the power of investment presents challenges, but also many opportunities, argues Asset Management One's [Kanako Tanaka](#)

As one of the 30 initial signatories of the Net Zero Asset Managers initiative and the only Japanese firm among its founding members, Asset Management One has committed to making its portfolio carbon neutral by 2050. The firm has also set an ambitious interim target of making ¥30 trillion (\$209 billion; €209 billion), or approximately 53 percent, of its AUM net zero by 2030.

To assist with the challenges ahead, AMO has built a sustainable-investment team, featuring senior sustainability scientist Kanako Tanaka.

"This was a big commitment for the company," says Tanaka. "But this is how we will create investments for a more sustainable society, through incorporating quantitative, qualitative and scientific perspectives."

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Q What role can the asset management industry play in decarbonising society?

I was attracted to the asset management industry because I wanted to become more involved in efforts to drive decarbonisation, and use my expertise in related scientific areas. Specifically, I am interested in how resources and finance, when properly allocated, can contribute to change.

As a member of committees that advise the Japanese government and international partners on policies and strategy, I've built firm relationships with government, academic and

industry stakeholders. I've also developed expertise in energy efficiency and decarbonisation, as well as recycling and the circular economy.

We need to develop stable, widely accessible and sustainable energy systems and technology infrastructure that can be used by everyone. To do that, we must invest in tech research and development, along with social infrastructure such as buildings and transportation. We need to fully consider how to use low-carbon materials and create a circular economy through efficient investment, with decision-making based on both quantitative research and economic evaluation that reflects social change.

Q What challenges does the asset management industry face in helping the

world to decarbonise?

The latest report of the Intergovernmental Panel on Climate Change, in which I was the lead author of the industry chapter, looked closely at the role that financing can play in achieving climate goals. Unfortunately, we are not yet on track to limit global warming to 1.5 degrees Celsius. In fact, greenhouse gas emissions in 2019 were the highest since records began. To achieve our targets, we need rapid and sustained emission reductions.

There are many options currently available in all sectors to reduce net emissions in line with global targets. But there are substantial investment gaps. We need three to six times more funding than we currently have annually to limit warming to below 1.5 degrees. Although there may be plenty of potential for investment, it is often more challenging to invest in a new technology in its early stages.

But looking at the development of renewable energy, for example, the cost of solar energy and lithium-ion batteries have declined by up to 85 percent since 2010, and wind energy costs are down by 55 percent, according to the IPCC report. In some cases, the cost of renewable energy has fallen below those of fossil fuels. At the same time, there has been large increases in capacity – solar and wind energy provided nearly 10 percent of the total global electricity supply in 2020, which far exceeded expectations from just a few years earlier.

Q To what extent is the journey to net zero an opportunity for investors?

Although investment in technology and innovation are certainly important, there are other perspectives to consider. What kind of society do we envision? It is important to think not only about decarbonisation, but also about other elements of social change – how we work, how we will cope with an ageing society, how we will utilise smart technology, AI or robotics.

Companies should see the business

“We want to create a world in which capital is directed to companies that are taking credible actions towards decarbonisation”

opportunities in these changes. I think asset managers can support business from a financial and investment perspective, and drive positive changes through constructive engagement. We want to create a world in which capital is directed to companies that are taking credible actions towards decarbonisation and achieving real changes in their ESG performance. We are actively engaging with companies to raise awareness and encourage further steps to increase their long-term corporate value.

It is important to show businesses these benefits in a tangible way, rather than just offer some notion about how they should be environmentally friendly. Through our engagement activities with investee companies, I would love to encourage and persuade companies to think that decarbonisation is a good and beneficial thing to do, rather than just something they must do. Each company should address climate change challenges as part of their business strategy, and together we will work towards solutions for a better and more sustainable future for us all.

Q What are the characteristics of Japan's carbon neutral strategy?

Japan's carbon neutral strategy has some unique elements. In December 2020, Japan launched its Green Growth Strategy with the aim of achieving carbon neutrality by 2050. The initiative

outlines ambitious plans for the adoption of renewables, advanced and safer nuclear power generation, low-carbon hydrogen production, and carbon recycling in the electricity sector. The strategy was designed as industrial policy and promotes the creation of a virtuous cycle of economic growth and environmental protection, and aims to enable the private sector to take up the challenge.

The strategy identifies 14 sectors with high growth potential for attaining carbon reduction targets. The government has pledged to mobilise all possible policies so that companies can pursue innovative research and development, and energy-efficient practices through incentives including capital investment via the Green Innovation Fund, worth ¥2 trillion over the next 10 years.

In addition, there are tax credits or special concessions for carbon-neutral infrastructure equipment and an increase in research and development tax credit limits. Alongside this, the government is to support high-value investment initiatives such as offshore wind power and other renewable energy projects to help mitigate risk.

The government is also currently discussing the national Clean Energy Strategy, which is focused on creating an economy that is centred on clean energy. The main pillars of this initiative are energy security, and the transformation of energy infrastructure and industry, using regulatory and institutional measures and a financial package.

The promotion and financing of green issues has clearly become a key priority. The government's strategy is diverse and wide ranging, with the involvement of many stakeholders. And asset managers are playing a key role in engaging both policymakers and companies to help achieve the overarching net-zero targets in Japan. ■

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3

Adopt double materiality reporting

For decades, listed companies have been required to report information considered ‘material’ to investors’ decision-making via accepted accounting standards. But, until recently, companies have been under no obligation to disclose information on how their activities affect society and the environment.

Advocates of ‘double materiality’ have sought to address this perceived anomaly. Organisations such as CDP and the Global Reporting Initiative have spent decades encouraging corporates to disclose data on emissions and other ESG factors. Meanwhile, the EU has begun moving towards mandatory double materiality reporting, most recently through its European Sustainability Reporting Standards.

Commenting on the release of the draft EU standards in May, CDP’s then-CEO Paul Simpson said the new disclosure rules “will bring more accountability, a better understanding of risks and opportunities and of the progress against EU and global goals, and will raise the bar on what is expected from companies”.

Whether the EU’s approach will become the global norm remains to be seen. The International Sustainability Standards Board, formed to develop a global baseline sustainability disclosure regime, has sent mixed signals on double materiality. Its focus is on an enterprise value approach, in which the focus is on how sustainability performance affects a company’s financial valuation. On the other hand, it has sought to co-operate with the GRI – which does take a double materiality approach – in harmonising disclosure requirements.

The GRI said in February that it believed it had made rapid progress in developing a comprehensive set of global standards, adding that “the concept of stakeholder capitalism not based on the concept of double materiality just makes no sense at all”.

4

Engage or divest?

It may seem intuitive that investors seeking to achieve net zero should divest from companies that produce fossil fuels or operate in other highly polluting industries. In practice, however, the dilemma is more complex than it first appears.

Many investment professionals warn that simply divesting from carbon intensive activities is unhelpful, or even counterproductive. “As an asset manager, there’s an easy way to go to net zero and there’s a hard way to go to net zero,” says Megan Starr, global head of impact at The Carlyle Group. She says that if Carlyle divested from around a dozen of the approximately 300 companies in its portfolio, the firm could reduce its Scope 1 and 2 emissions by as much as 95 percent. But, says Starr: “That does not change a molecule of carbon dioxide in the atmosphere.”

Complicating matters further is the growing number of state governments in the US that are seeking to punish asset managers that they perceive as hostile to oil and gas. Texas announced in August that it would require state pension managers to divest from funds that – according to the state government – boycott fossil fuels. Florida has followed Texas’s lead, but other states such as Maine are moving in a completely opposite direction – requiring their pension funds to divest from fossil fuels within the next few years.

While these fevered debates are unlikely to go away, there is no doubt that sustained engagement from investors can also produce beneficial results. “What really matters is the individual trajectory of a given company or asset – where the company starts when you invest in them and where they are when you exit,” says Starr. “The highest decarbonisation potential is actually frequently in the most carbon intensive companies.”

5

Scale up
green financing

Given the pressing need to direct financial flows towards projects that accelerate the journey to net zero, it is not surprising that 'green bonds' and similar instruments have become increasingly popular.

A green bond works much like a regular bond. The key difference is that the funds raised are used to finance projects that the issuer claims will have a positive impact on the environment. The Climate Bonds Initiative (CBI) reported in October that a cumulative total of \$2 trillion in green bonds have been issued since 2007. The market has grown at an annual rate of more than 50 percent in the last five years, peaking in 2021.

After announcing the \$2 trillion milestone, Sean Kidney, CEO of the CBI, said the green and sustainable bond issuance must reach \$5 trillion by 2025. "To stand a chance of meeting the Paris Agreement's 2050 targets, we must slash emissions in half [in] this decade. This means scaling capital flows to climate causes at speed."

The traditional 'use of proceeds' green bond, in which proceeds are ringfenced to specific purposes, has been joined by various other instruments as the market has evolved. These include sustainability-linked bonds and loans (SLB; SLL), where the interest rate is partly determined by a company's performance against pre-agreed ESG targets. The company may, however, use the proceeds of SLBs and SLLs for general corporate activities, rather than for specific projects or purposes.

But many investors are unconvinced that any such instruments always contribute to greener outcomes. It is not hard to find examples of green bonds being used to finance activities that stretch the definition of 'green' past the point

of credibility. A green bond issued by Airport Authority Hong Kong in January was criticised by Lucie Pinson, director of environmental think tank Reclaim Finance, who claimed that "labelling this project as green is pure high-flying greenwashing". AAHK, however, noted that it had obtained a second-party opinion from Sustainalytics, which found that the bond was "credible and impactful" and aligned with various guidelines and principles.

Thankfully, there has been steady progress in developing frameworks to help protect investors from greenwashing. The CBI and the International Capital Market Association have both developed voluntary certification schemes for green financial instruments, while the EU is preparing the European Green Bond Standard.

Nevertheless, the green and sustainable finance market faces headwinds in the near-term. Green bond issuance in the first half of 2022 was down by 4 percent year-on-year. This partly reflects the reality that green financial instruments are subject to the same market forces that have resulted in subdued debt issuance more generally this year.

Amid a difficult market environment, rising concerns about greenwashing certainly does not help the cause of green bonds and instruments like SLBs and SLLs. Combatting the perception that greenwashing is rife in the labelled finance market is vital if green financial instruments are to fulfil their potential.

"To stand a chance of meeting the Paris Agreement's 2050 targets, we must slash emissions in half [in] this decade"

SEAN KIDNEY
Climate Bonds Initiative

KEYNOTE INTERVIEW

Taking sustainable infrastructure to the next level



Jonathan Walker and Rosie French from Gresham House say alternative assets are vital to decarbonising the economy

If the world is to reach net zero, investors need to go beyond renewables and put money to work in a wide range of sustainable infrastructure assets. Jonathan Walker and Rosie French, sustainable investment managers at specialist alternative asset manager Gresham House, tell us more about the role of sustainable infrastructure and battery energy storage systems in decarbonisation.

Q What role does sustainable infrastructure play in advancing the world's climate ambitions?

Jonathan Walker: We're a long way from being able to mitigate the worst outcomes of the environmental and

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social challenges we are facing today. We can't keep investing in the same way and expect to get to net zero. New infrastructure is required to achieve our global sustainability and climate ambitions. That's why we invest in new assets that decarbonise harder-to-abate areas of the economy.

For example, our sustainable infrastructure team has invested in vertical farm provider Fischer Farms, which, according to calculations from an expert sustainability consultant, requires less than 1 percent of the total land and water required for conventional farms

to produce the same yield. Compared with importing the same amount of yield from Europe, it could save up to 4,000 tonnes of CO₂ a year, equivalent to taking 2,100 cars off the road. Assuming that we are replacing crops that have been imported long haul, it's as much as 1,700 times more carbon efficient.

Q How can investors in sustainable infrastructure ensure that they create impact?

JW: There are three core elements that set impact funds aside from other funds. They define their social and environmental objectives; they understand how results will be measured; and they can demonstrate that their investments

achieve ‘additionality’ in terms of benefits that would not have happened without the investment.

For our sustainable infrastructure funds, we’ve built an impact framework aligned with the Impact Management Project. We consider the social and environmental benefits of our investments at all stages of the process, with detailed analysis of the positive and negative externalities. We align our investments with the relevant Sustainable Development Goals to assess whether they create a long-term competitive advantage.

We engage actively by using our expertise and networks to improve the environmental or societal performance of the businesses we invest in, and we appoint a team member as an investment director on the board. Each investment is intended to build and operate infrastructure that solves social or environmental issues, creating a defensible, profitable market position.

Q How supportive is the regulatory environment for investment in sustainable infrastructure?

JW: Looking at the practicalities of investing into sustainable infrastructure, it is difficult at present for defined contribution (DC) pension schemes to allocate to illiquid or private market strategies. This means there are trillions of dollars that are not being allocated to key areas. The Bank of England governor has recommended lifting the illiquidity cap for DC pensions, and earlier this year the then-pensions minister outlined that he was determined to open illiquid asset classes to DC schemes. The UK’s Productive Finance Working Group suggests around four-fifths of DC pension funds’ investment is in listed equity and corporate government bonds, so lifting these kinds of liquidity caps could be the single biggest policy driver that could deliver investment in sustainable infrastructure.

Looking at environmental regulation, the 2021 Environment Act, which aims to drive new investment into

nature and biodiversity, will provide the significant momentum required for our sustainable infrastructure funds to drive new investment in nature and in particular biodiversity net gain (BNG). Further, we eagerly await further details of the UK Sustainability Disclosure Requirements and the UK’s green taxonomy, and hope that this will further catalyse investment into sustainability-orientated funds.

Q What types of investment are needed to decarbonise the grid?

Rosie French: The UK’s net-zero strategy aims to decarbonise the energy system away from fossil fuels towards low carbon sources of energy. Indeed, this strategy includes a target to fully decarbonise the energy system by 2035. We’re also seeing a shift towards the electrification of the broader economy as part of this strategy, such as the move from gas to electric heating in homes, and the replacement of petrol or diesel vehicles with electric alternatives. This shift will lead to an overall increase in electricity consumption.

As we move to a world where electricity demand is going up and renewables are playing an increasingly important role in providing low-carbon electricity, ensuring a stable supply of electricity is more challenging. Renewables are essential for decarbonisation, but wind and solar alone cannot be

“While our assets have a direct carbon impact, they also enable the decarbonisation of the grid”

ROSIE FRENCH

relied on to deliver a secure supply due to their intermittency.

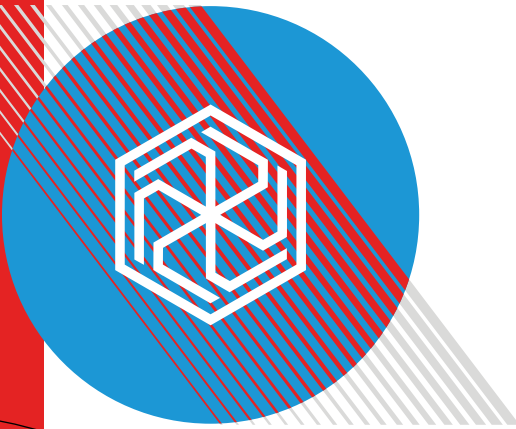
Battery energy storage systems (BESS), therefore, are essential in providing stability to the grid. BESS enable electricity to be stored at times of oversupply and supplied back to the grid at times when renewable generation is lower, supporting supply to the consumer. By importing surplus power generation, BESS can also help to maximise the output from renewable energy sources by ensuring that wherever possible surplus generation is not wasted. BESS will play a major role in supporting energy security while we replace more carbon-intensive sources of power.

Q How easy is it to measure the carbon footprint and carbon impact of these assets?

RF: We’ve worked with a carbon consultant to measure the financed emissions of our portfolio at Gresham House, using guidance from the Greenhouse Gas Protocol and the Partnership for Carbon Accounting Financials. This process has enabled us to estimate the Scope 1 and 2 emissions of our battery assets by using the grid’s half hourly carbon emissions data and net export data to estimate the overall operational carbon footprint of the assets.

While our assets have a direct carbon impact, they also enable the decarbonisation of the grid. Of greater challenge is how to measure the important role that BESS will play in decreasing the carbon intensity of the electricity system, and we’re working to develop a credible means of measuring and demonstrating this.

We also recognise that a lot of the carbon emissions associated with batteries sit in the supply chain and construction of the assets. Our asset management and construction teams are working with contractors and suppliers to start to gather carbon data for upstream emissions and those related to construction. Getting a fuller picture will take time but we are committed to this analysis. ■



Energy systems

*Achieving net zero depends on investment in transmission and storage, alongside new sources of green generation, writes **Evie Rusman***

Humankind has enjoyed the production of energy since first mastering fire. Today, practically every task we perform is predicated on a deeply complex network of power production. Annual global energy consumption is estimated at 580 million terajoules – that’s equivalent to 13,865 million tonnes of oil. And demand for energy is only set to increase. Keeping those figures in mind, it will come as no surprise that energy supply is the biggest contributor to global greenhouse gas emissions. The sector is responsible for around 35 percent of total emissions, according to the Intergovernmental Panel on Climate Change.

These sobering statistics highlight the importance of moving away from harmful sources of energy like fossil fuels and finding alternative solutions. The good news is that the energy transition is on the agenda for most investors – global investment in the energy transition increased from \$264 billion 10 years ago, to \$755 billion last year, according to BloombergNEF figures. While things are moving in the right direction, even greater levels of investment are needed. BloombergNEF says annual investment in the energy transition must triple between 2022 and 2025, and then double again between 2026 and 2030 in order to meet vital climate change targets.

On top of that, geopolitical events are threatening to slow down progress, with energy security being top of mind, especially amid the war in Ukraine. As a result, there is a worry that energy security will overtake the energy transition in terms of priority. However, regardless of external factors, there are certain steps that need to be taken to carry out the energy transition, which we explore over the next few pages. ■

27% The increase in energy transition investments from 2020 to 2021

\$755bn Investment in the energy transition in 2021



Photo credit: Ben Payton

Winds of change: investment in wind and solar energy will transform energy systems in the coming years, particularly in Europe. But accompanying investments in storage and transmission will be needed to ensure grids can cope in a new era.



6

Invest in renewable energy generation and storage

Renewables are the key to the energy transition. Not only do they offer an alternative to fossil fuels, but they also increase energy security.

Tom Williams, partner and head of energy and infrastructure at investment manager Downing, argues that both of these factors have encouraged investment in renewable energy. “I first started talking to people seriously about investing in renewables in Europe back in 2010. In those days, one of the key reasons to invest in renewables, and one of the reasons why governments should shift their policies towards renewables, was energy security. But that has been a bit drowned out in the intervening period by a wave of discussion around the climate crisis.”

Alex Brierley, co-head of Octopus Renewables, adds: “Facilitating a successful transition to renewable energy is, in my view, the central pillar to achieving net-zero. Renewables infrastructure can present a compelling investment opportunity, targeting stable and predictable cashflows against a backdrop of heightened market volatility, along with attractive risk-adjusted returns.”

The International Energy Agency predicts that renewables capacity will match the power capacity of fossil fuels and nuclear combined by 2026. The move to renewables is also being accelerated by Russia’s invasion of Ukraine and the attempt to phase out the use of Russian fossil fuel imports.

However, despite being a ‘green’ energy source, investors also need to consider how to mitigate negative impacts from renewables. Vemund Olsen, a senior sustainable investment analyst at Storebrand, tells *Responsible*

Investor that in certain areas renewables can be damaging for not only wildlife, as projects can destroy habitats, but also Indigenous peoples, whose homes will be impacted. “Right now there is a very strong push for increased renewable energy, as well as increased mining for metals and minerals, that are necessary for the green transition,” he says. “But I think investors are increasingly aware that we have to be really careful in terms of doing proper due diligence to make sure that we don’t have any unintended negative impacts on Indigenous peoples.”

Intermittency is another issue; there needs to be a way to store renewable energy for periods where renewables cannot generate enough. Cue the rise in investors interested in battery storage. According to IEA data, investment in

battery storage surged by almost 40 percent year-over-year in 2020 to \$5.5 billion. This rapid increase can be put down to innovations in technology as well as a reduction in the cost of battery storage systems.

“Renewable energy and storage can work hand-in-hand in a symbiotic relationship,” says Alex Leung, director of infrastructure research and strategy at UBS. “We often hear about how we need energy storage to absorb the oversupply of renewable generation. But on the other side of the equation, we also need more energy storage to support new solar and wind capacity. Energy storage is an enabler for higher renewable energy penetration.”

“Renewables infrastructure can present a compelling investment opportunity”

ALEX BRIERLEY
Octopus Renewables



Gresham House
Specialist asset management

Investing in solutions for now and the future



Gresham House is a specialist alternative asset manager, offering funds, direct investments and tailored investment opportunities.

Vertical farming can grow in 1 acre what it takes 250 acres out in the field, using up to 98% less water than traditional farming methods.

7

Improve energy efficiency

Prioritising energy efficiency is a vital, but often overlooked, step in meeting climate change targets.

“Energy efficiency solutions are not always the flashiest, but they are critical to achieving net-zero carbon emissions,” says Michael Albrecht, managing partner of Ridgewood Infrastructure. In line with Albrecht’s opinion, the IEA states that energy efficiency solutions are expected to be the most prominent way for companies to reduce their carbon footprints.

The label of ‘energy efficiency’ incorporates a wide range of different steps to enable residential and commercial buildings, as well as transport and industry to function while using less energy. Efficiency goes hand in hand with electrification – and often relies on digital technology to enable resources to be managed more effectively. Key priorities for energy efficiency range from improving insulation in buildings, to installing more efficient lighting systems, and making industrial processes such as steel production less energy intensive.

Adeline Morin further argues that efficiency is a catalyst for innovation. “Efficiency plays are where we see most innovation today. When you produce heat, you produce smoke, and we are now able to use the heat from that smoke to reheat the water within the network,” she says.

Governments also have a role to play in improving efficiency. Earlier this year, the Energy Efficiency Infrastructure Group in the UK called on the government to embrace efficiency within infrastructure as it addresses three pressing factors: the cost of living crisis, net zero and the ‘levelling up’ agenda. In addition, the EU Agency for the Cooperation of Energy Regulators urged its member states to adopt efficient energy practices.

8

Roll-out transmission infrastructure

Without transmission, there is no energy. Investing in the right infrastructure to bring renewable energy to consumers is critical.

According to figures from the IEA, a 50 percent rise in grid spending could be needed over the next decade if the world is to meet its sustainability goals. In particular, the IEA highlights the importance in investing in the nearly 7 million kilometres of transmission lines needed globally to deliver energy.

Chris Archer, co-head of EMEA for Macquarie Asset Management’s Green Investment Group, says: “There is no transition without transmission, and so regulatory authorities are thinking ahead, planning the multi-year investment programmes required in power grids to ensure this infrastructure is fit for purpose in a net-zero energy system.”

Peter Schuemers, co-head of investments at Energy Infrastructure Partners, agrees: “Often forgotten, transmission infrastructure – for electricity and molecules – is inseparable from renewable generation. Being the indispensable condition for the operation of all these assets, it will remain highly attractive. Significant high price spreads between European countries, and even within those countries such as in the Nordic region, are an unmistakable sign that transmission capacity is lacking behind demand, thus inhibiting exchange of energy and mutual assistance in times of crisis.”

Transmission investment is particularly needed in less economically developed countries. For instance, 52 percent of people who live in sub-Saharan Africa currently live without access to electricity. Therefore, in these regions, investment in transmission and distribution infrastructure is vital to connect off-grid populations with new sources of electricity generation, which are often found in remote areas away from main population centres.

An aerial photograph of a vast solar farm. The solar panels are arranged in neat, parallel rows that follow the contours of the land. The panels are a deep blue color. In the background, there are rolling green hills and mountains under a clear sky. The overall scene is bright and sunny, suggesting a clear day.

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KEYNOTE INTERVIEW

The role of infrastructure in the energy transition



Energy transition infrastructure may present investors with portfolio opportunities, say TD Asset Management's [Carl Elia](#) and [Ben Lemire](#)

With many countries moving to greener energy sources, investors are being called upon to finance a multi-trillion-dollar build-out for energy infrastructure focused on the transition to the low-carbon economy. In this interview, *Responsible Investor* sat down with Carl Elia, vice-president and director, infrastructure investments, and Ben Lemire, vice-president, ESG, alternative investments at TD Asset Management, to discuss how the transition to clean energy may present infrastructure investment opportunities. They say that long-term thinking is key, and argue that investments in generation, storage and transmission of energy will play a key role in the transition.

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Q What are your priorities in your transition strategy?

Carl Elia: I believe that investing in new energy infrastructure may present an opportunity to generate an attractive risk-adjusted return. Over the last 20 years, global infrastructure investment has mainly been dominated by large investment managers. In addition, renewable energy and power investments tend to be mid-market, especially when it comes to wind or solar infrastructure. As such, our priorities for the energy transition have focused on the mid-market or smaller investments,

as well as growth. Participating in the energy transition requires the ability to build new infrastructure, and that has been a key part of our strategy.

Ben Lemire: Just among the OECD countries, we're looking at almost \$7 trillion in global investment by 2030 to meet climate and development objectives. A lot of that capital is going to be focused on greening the grid. Long term, 95 percent of electricity production will have to be clean and green by 2050, according to the Science Based Targets initiative. There is also an increasing focus on energy security, with utility prices skyrocketing in many markets. While in the short term, the costs of decarbonisation and

electrification can be challenging, in the long term, I believe there's a lot of potential in electrification and fuel switching to support the energy transition in most markets. Carbon-intensive infrastructure sectors are expected to be challenged during the energy transition, particularly if they operate in markets where regulations are becoming more stringent around carbon pricing. In our view, there's an opportunity for infrastructure investors in the energy transition to have exposure to renewable energy strategies and build-up capabilities and assets.

Q Where are opportunities emerging geographically?

BL: We have a global focus with our infrastructure funds, but here in Canada we're seeing lots of opportunities. Certain provinces that historically have had carbon-intensive electricity grid mixes are transitioning to cleaner, greener forms of energy. So, there's lots of opportunity – not only in renewable energy generation, but also in energy storage, as well as transmission and distribution infrastructure. Many of the grids in Canada are pushing the decarbonisation agenda quite aggressively, and we believe that this will only accelerate between now and 2030.

In the US, there's a lot of potential with the new Inflation Reduction Act. We're seeing reforms to provide tax credits for renewable energy, which may bolster investment. In the EU, green hydrogen is increasingly being prioritised as part of the solution to energy security, especially for countries that rely heavily on Russian oil and gas.

CE: When thinking about jurisdictions, our focus is on stability and the commitment to decarbonisation at the government level. It's about ensuring that we're in the right markets. As an infrastructure investor, we're putting money to work for 30-50 years, so we need to understand the commitment of our counterparts and relevant policy frameworks that are in place.

Q How does a focus on electrification impact where you target investment?

CE: Electrification is incredibly important. The worldwide electrical grid is running at about 7 terawatts today – that could grow to over 20 terawatts in the next 30 years. Over 80 percent of that growth will be in onshore wind and solar energy, and upgrades will be needed for the grid to support those renewables, according to our research.

When thinking about long-term infrastructure investment, the target technology needs to be sound. We look for proven technology that's been deployed for several years. We see opportunity now in traditional wind and solar energy generation, which has been around for 20 years or so.

BL: There's also an opportunity in energy storage, particularly when combined with renewable generation. New storage capacity is needed for grid stabilisation, resiliency and redundancy. While we think a lot about the mitigation of climate change and energy transition opportunities, we also look at physical climate risk and grid adaptation requirements. For example, we consider whether the places where we operate may be exposed to physical climate hazards, and if new infrastructure helps reduce imbalances in the network and improve overall grid resiliency.

It's also important to consider the future-readiness of our assets on the path to energy transition, for example,

“There's a lot of potential in electrification and fuel switching to support the energy transition”

BEN LEMIRE

by installing electric vehicle charging stations in highway service facilities and developing the infrastructure to expand those stations as needed. Finding those cost-optimal capital injection points for putting transition assets or technology in the right space at the right time are important because you don't want to put that capital to work too early.

Q What questions are you getting from investors about the energy transition and its impact on their portfolios?

BL: We're seeing many investors increasingly focus on climate risk and climate mitigation. They are becoming more sophisticated in the depth and breadth of their queries, and their understanding has really evolved in the last few years. Many investors want us to have a holistic understanding of material ESG factors depending on what sector, what asset and what location we're operating in. The energy transition is a big part of that, but we're seeing increased interest in all facets of ESG. These investors are starting to think about their portfolios not only from a financial materiality or investment return perspective, but also in terms of the ESG impact associated with their portfolio.

CE: From a return perspective, investors may see an opportunity to access returns based on the commercial attractiveness of investments that help to accelerate the energy transition. I think investors have to be thoughtful about where that growth fits within a portfolio. As business models evolve around new technologies, some investment managers have launched funds as 'transition funds' or 'green funds' and sometimes they are being slotted into infrastructure funds. But the return profile and the risk profile of such funds tend to look more like venture capital. Investors should think carefully about how these types of investments fit within their broader portfolios. ■



Scale up green hydrogen

There is much excitement about the potential for hydrogen to help replace natural gas; hydrogen is considered 'green' when electrolysis is powered by renewable energy. Green hydrogen could also serve as a form of energy storage, because it can be converted back into electricity when needed.

The IEA says that switching to green hydrogen would save the 830 million tonnes of CO₂ that are emitted annually by the gas produced using fossil fuels. "Hydrogen is a way of storing excess energy from renewables, turning electricity into clean fuel at times when it isn't needed on the grid and is therefore lowest cost," says Dan Cheng, managing director in Brookfield's renewable power and transition group.

Barney Coles, managing director and co-head of clean energy at Capital Dynamics, agrees: "Green hydrogen will be the next big trend – the ability to create a new green fuel through the pairing of renewables with electrolyzers for the transportation and industrial sectors will be a game-changer."

Bearing that in mind, governments are starting to take action towards hydrogen. For instance, in the US, the Department of Energy has set aside \$8 billion to support eight to 10 hydrogen hubs. "Hydrogen energy has the power to slash emissions from multiple carbon-intensive sectors and open a world of economic opportunity to clean energy businesses and workers across the country," Jennifer Granholm, the US energy secretary, said in June.

Sam Pyne, managing director at private equity investor Haddington Ventures, says further government support is vital. "The creation of a hydrogen economy is on the horizon. Nevertheless, the government needs to accelerate more projects in the US.

A hydrogen production tax credit has been proposed [which would do this]."

Meanwhile, the EU published its REPowerEU plan in May 2022, as part of a wider hydrogen strategy. The plan outlines steps to accelerate renewable hydrogen to speed up the EU's energy transition. Its goal is to produce 10 million tonnes of renewable hydrogen in the EU, and import a further 10 million tonnes, by 2030.

Renaud de Matharel, CEO and managing partner at Cube Infrastructure Managers, adds that hydrogen is a vital component when investing in renewables. "To run a country like Germany mostly on wind and solar requires a massive amount of energy storage (roughly 48 hours of storage)," he says. "We believe this is why hydrogen makes a lot of sense."

Even though green hydrogen has huge benefits, it is still very much in its infancy, with few investors placing firm bets. Around 90 percent of hydrogen produced today involves fossil fuels. "While the hydrogen sector has huge potential, it is still very nascent," argues Carsten Johansen, managing director at Impax Asset Management. "We have looked at some opportunities involving hydrogen co-located with solar and coupled with an industrial offtake, and we continue to evaluate the economic equation. I think it is likely that more government intervention will be required in order to make it more mainstream than it is today."

*"Green hydrogen will
be the next big trend"*

BARNEY COLES
Capital Dynamics

10

Nuclear returns to the spotlight

Nuclear has long been a controversial energy source, with many viewing it as a 'grey' area when it comes to sustainability.

The main advantage of nuclear is that it provides a stable and predictable supply of electricity – unlike wind and solar, which are inherently intermittent. “Nuclear straddles sustainable development from both environmental and socioeconomic perspectives,” says Patrick Wood Uribe, chief executive of UK fintech firm Util. “It is widely affordable, available and reliable, insulating countries – or liberal democratic unions – from energy shortages and insecurity. And, unlike oil and gas or renewables, nuclear doesn’t demand and deplete natural resources.”

However, nuclear also presents a number of question marks around safety, waste and the overall benefit to the environment, including during the construction phase.

“The construction of a nuclear power station tends to be fairly heavy on cement, for example, and that is high emission and particularly hard to abate,” says Eoin Murray, head of investment at the international business of asset manager Federated Hermes. “We need to think about these things in a proper full lifecycle assessment way. And that means thinking about how you dispose of radioactive material and if the general populace is happy with how we do that.”

The mixed attitudes towards nuclear are reflected in a variable policy environment across the globe. Nuclear meets up to 70 percent of France’s electricity requirements, although over half of French reactors were offline during the summer because of water shortages and maintenance issues. Germany is seeking to ditch nuclear altogether, though it has postponed the closure of its last nuclear power stations amid the energy security crisis. Meanwhile the UK government has signalled its intent to invest in a new generation of nuclear power plants.

11

Time to develop carbon capture?

Carbon capture technology is in its early stages of development - and not everyone agrees that increased investment is welcome.

A recent Intergovernmental Panel on Climate Change (IPCC) report suggests that technologies such as carbon capture and storage are likely to be necessary if temperature increases can be kept below 1.5C. And with the climate crisis accelerating, advocates argue that investment is urgently needed to scale carbon capture technologies.

“Analysts project that over \$100 trillion of investment between now and 2050 will be required,” says Raj Agrawal, global head of infrastructure at KKR. “We believe much of this will be in sectors where we are actively investing, such as renewable power generation, and in the scale up of newly proven technologies, such as battery storage and carbon capture, where we are spending a lot of time. In this way, growth in infrastructure investing is critical to the drive to net zero.”

Nikki Reisch, climate and energy programme director at the Centre for International Environmental Law, disagrees. She argues that the only solution to the current crisis is to phase out harmful energy practices rather than rely on new tech.

“Only a rapid and equitable phaseout of fossil fuels can avoid overshooting 1.5C,” says Reisch. “Relying on speculative technologies that prolong the use of fossil fuels and purport to deliver emissions reductions... will cost lives and inflict further irreversible harm. Carbon capture and storage cannot make coal clean, turn gas green or render oil carbon-free.”

KEYNOTE INTERVIEW

A clear path towards net zero



Bruno Bamberger from AXA Investment Managers discusses how the conversation around net zero has evolved

Investors are lining up to make commitments to achieve net-zero portfolios. But with many different considerations to keep in mind, the process can become daunting. Bruno Bamberger, senior solutions strategist at AXA Investment Managers, discusses the challenges that investors face in turning commitments into action and the role that proper measurement plays in the process. He also highlights the impact of climate-related risks on the road to net zero, as well as the importance of avoiding greenwashing.

Q How have commitments towards net-zero goals shaped the industry? What challenges do investors face?

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There's been a huge collective commitment to net zero across the entire investment industry in recent years. Investors that have joined the Net Zero Asset Managers initiative have \$61 trillion in AUM. That's an enormous amount of capital committed to net zero. These commitments send a clear and noticeable signal to all market participants.

The underlying companies themselves are very aware of what investors are focusing on, and many of them are changing their strategies in light of this. Other market participants, such as data providers, are also focused on the

opportunity – they're collecting and releasing more and more data that asset owners and managers can rely on.

One of the challenges facing investors is the fear of greenwashing. A lot of due diligence from asset managers is needed to overcome this valid concern. We also need to straighten out the confusion between achieving net-zero portfolios, and actually getting the world to net zero.

Q How should investors see the relationship between net zero and the Paris Agreement?

Imagine a bathtub with water flowing in from the taps and out through the plughole. The water flowing in is the

carbon emissions released by natural means and from humankind's burning of fossil fuels. The water flowing out is the carbon sinks, like forests, and man-made technologies such as carbon capture. We get to net zero when the water flowing in equals the water flowing out, so the water level in the bath stops rising.

By contrast, the Paris Agreement relates to temperature increases – continuing the analogy, it's about how full the bathtub is when the water stops rising. The fuller it is, the hotter the global temperature and the greater the impact on the Earth. The two are related, but not the same. It's important for investors when setting portfolio-level objectives to ensure they're achieving the goals they want to achieve.

Q How are actions on reducing emissions measured and monitored?

We've seen an explosion of interest in measuring and monitoring carbon emissions within portfolios. When looking at carbon emissions, we can boil it down to two types. There are absolute emissions, the total amount of emissions attributed to a portfolio, and then there's carbon intensity – the emissions per million dollars invested. Both metrics have their uses, and can be used in different ways by investors.

Most important, however, is how these metrics change over time. Company and asset owner portfolios may have different starting points and different end objectives. Therefore, progression is more important than stationary and historical emissions values. There are also metrics related to net-zero alignment that are different from common emissions. Several initiatives and frameworks are built on this.

Q How does data inform net-zero strategies?

Qualitative and quantitative information from internal sources and third-party providers are essential to measure net-zero alignment in client portfolios. One example of a third-party

“We’ve seen an explosion of interest in measuring and monitoring carbon emissions within portfolios”

initiative that gives a high-level insight into company-level alignment is the Science Based Targets initiative, which assesses whether the commitments that companies have made are compatible with limiting temperature increases to below 2C.

But when looking at net zero, measuring alignment can't be done purely on a commitment basis. When looking at each company's transition plan, we must consider their capital expenditure and proportion of 'green' revenue to determine whether they're aligned to net zero.

What's important to asset owners is understanding what underlying companies can do, and how governments will deliver regulations that create the conditions for a credible and ambitious transition to net zero. Data plays a critical part of this journey.

Q How can climate-related risks be factored into the road to net zero?

Climate-related risks and net zero are two separate but related concepts. A company can have high climate-related risks, but also be perfectly net-zero aligned – perhaps because it has physical assets located somewhere exposed to physical risks such as seawater flooding. Even portfolios that have exited the fossil fuel industry could still be impacted by risks from the supply chain of their remaining companies, or from changing consumer habits impacting their revenue streams. So investors need to consider climate-related risks

and the net-zero transition, not just one or the other.

If the entire industry divested from high emitters, we'd have an even greater energy challenge on our hands. And those companies would not be ushered towards changing their business models and wouldn't be encouraged to produce energy from renewables.

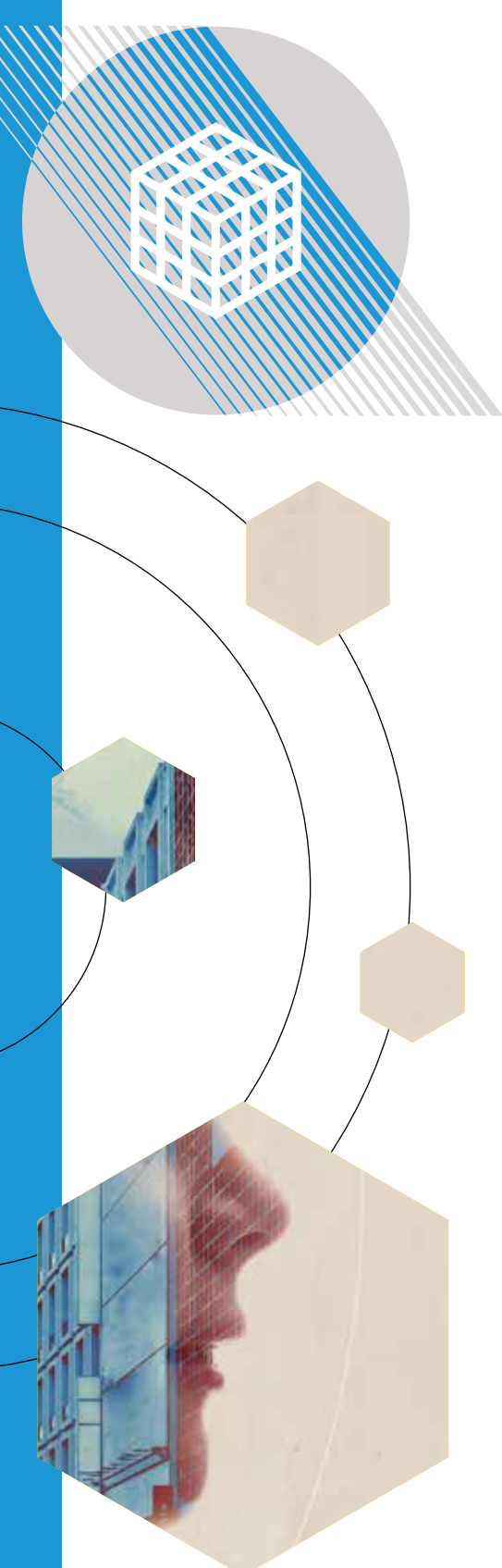
Although climate change is a risk factor for asset managers and owners, we don't think there's an advantage in suddenly removing that risk from portfolios. What's important is that risks are measured so that asset managers can determine how to adapt portfolios to support an effective transition.

Q How should investors engage with companies lagging in reducing emissions?

Engagement is key to any net-zero strategy for asset managers and owners. At its most basic level, engagement could simply be letting companies know what you expect of them: providing more data across Scope 1, 2 and 3 emissions; setting net-zero targets; and changing their business models to be more sustainable while sticking to the plans that they've already made.

But most engagement goes beyond this, going into greater detail about what strategy these companies should undertake to reach net zero, and how this can be done in a financially sustainable manner. This ensures that investors and companies themselves benefit from it.

Companies must understand the implications in terms of sourcing financing in the future. Releasing debt could become tougher and their cost of capital could increase if they're not sticking to their net-zero commitments. Are companies falling behind for a justified reason? Or is it simply a case of greenwashing, where companies have committed to net zero with no intention of following through? The answer determines whether we continue to engage with them, whether we further escalate the efforts, or if we divest from them as a last option. ■



Industry

*Massive investment will be needed to make polluting industrial processes greener, writes **Matt Smith***

Energy use and GDP growth have been correlated since the start of the industrial revolution, but few politicians would countenance shrinking their country's economy to reduce greenhouse gas emissions. So, it is up to private industry – with policymakers' support – to find new ways of operating that cause no environmental harm.

Some progress has been made – renewables-based electricity generation reached a record peak in 2021, exceeding 8,000 terawatt hours; but global carbon dioxide emissions also hit an all-time high, according to the International Energy Agency. Last year's 6 percent rise in CO2 emissions was the same percentage by which the global economy grew in 2021, underlining the link between industrial activity and prosperity.

Coal – the most environmentally destructive fossil fuel – was the source of more than 40 percent of the year-on-year growth in CO2 emissions. This was due largely to high gas prices spurring utilities to switch to coal, the IEA notes. Global CO2 emissions from industry was 5 megatonnes higher in 2021 versus (pre-pandemic) 2019, while those for the buildings sector surged 81 megatonnes over the same timeframe.

Yet, amid the gloom, major industries are finding ways to decarbonise their activities; electrification of heating, for example, is likely to cut natural gas consumption substantially in the long term.

Massive investment will be needed to produce the minerals needed for energy transition technologies, including electric vehicles, energy storage systems, wind turbines and solar panels. Meanwhile 'green' hydrogen and biomass could replace coal in the steelmaking process, and energy-intensive cement-making practices could ultimately be made obsolete by more environmentally friendly techniques. ■

40x Expected increase in lithium consumption by 2040, driven by the electric vehicle rollout

\$100bn Investment needed in green steel in the next decade

Into the furnace: steel is at the heart of modern industry, but accounts for up to 9 percent of global emissions. Replacing coal with hydrogen in steelmaking could help to turn the sector green.



12

Expand mining of energy transition materials

Transitioning to renewable energy will massively increase demand for many different materials that have hitherto only been used in niche applications.

Onshore wind plants use nine times more minerals than a gas-fired power station, while an electric car needs six times the mineral inputs of a conventional vehicle, according to the International Energy Agency. Electricity networks, which rely on copper and aluminium, will also expand as we electrify heating and transport. Besides copper, wind and solar plants rely on a huge number of metals, including rare earth elements zinc and silicon.

“Lithium, nickel, cobalt, manganese and graphite are crucial to battery performance, longevity and energy density,” a 2022 IEA report states, highlighting the importance of rare earth elements for electric vehicle motors and wind turbines, as well as nickel and zirconium for electrolyzers and platinum-related metals for fuel cells.

For countries to meet the Paris Agreement climate commitments, the energy sector’s consumption of minerals will surge over the next 20 years, the IEA predicts. The agency forecasts that the industry will take more than 40 percent of global copper production, 60-70 percent of nickel and nearly 90 percent of lithium. This demand will cause lithium consumption to increase 40-fold, and graphite, cobalt and nickel to grow by 20-25 times, the IEA estimates.

“Although shortfalls can be expected in the coming years, several strategies can be deployed to avoid major supply challenges in the period to 2050,” the International Renewable Energy Agency stated in a 2021 report. “These strategies include increased extraction, product design to avoid or minimise use of critical materials, and recycling of products to recover scarce materials.”

13

Take gas out of heating

Many countries are highly reliant on gas for central heating. However, heat pumps and district heating schemes could become the norm as part of efforts to lower carbon emissions.

Heating accounts for nearly half of UK energy consumption and 37 percent of carbon emissions. Yet low carbon sources, including renewables, provide 54.1 percent of UK electricity, so electrifying heating will reduce fossil fuel use.

The UK has one of the highest rates of gas dependence in central heating in Europe. Nearly four-fifths of British households rely on gas central heating; the figure is almost 90 percent in the Netherlands, but in the EU as a whole, just under half of heating is provided by gas.

District heating, which distributes hot water (and therefore heat) from a central location to multiple buildings is commonplace in much of Europe. Such systems could provide up to 20 percent of UK heat demand by 2030 and 43 percent by 2050, according to government estimates, while also delivering numerous environmental and economic benefits, including lower carbon emissions and cheaper heating and maintenance.

Air source heat pumps function like a refrigerator in reverse, extracting heat from outside to heat a building interior. Recent tech advancements have made heat pumps more viable in colder climates. For every unit of energy the devices extract from the air they deliver four units to the building interior, so provide far greater efficiency than gas boilers.

In 2020, 36,000 heat pumps were installed in the UK. To meet the nation’s 2050 net zero target, 900,000 heat pumps must be installed annually by 2028, according to the Committee on Climate Change, which wants all new homes from 2025 to be built without gas- or oil-fired heating.

14

Make green steel
a reality

Steel is the powerhouse of global industry, but this vital material is also a huge source of carbon emissions. Accelerating technological advances to enable the industry to shrink its environmental footprint will be a vital step towards net zero.

In making steel, coal is usually burned to produce carbon monoxide, which then works as a reducing agent on iron ore, removing oxygen to create a purer form of iron. Each tonne of steel made in 2020 also emitted 1.89 tonnes of carbon dioxide.

Steelmaking generates 7-9 percent of anthropogenic CO₂ emissions, according to the World Steel Association, but German conglomerate thyssenkrupp believes it has found a way to make the process greener. Following tests that began in 2019, thyssenkrupp in September announced it would invest more than €2 billion in building its first ‘direct reduction’ plant at its vast Duisburg steelworks. The facility will use hydrogen as the reducing agent instead of coal.

Although thyssenkrupp did not respond to requests for comment, earlier announcements specified the project would use green hydrogen. For each tonne of green hydrogen consumed to produce steel, 25 tonnes of carbon dioxide will be abated, thyssenkrupp estimates.

Rival manufacturers have launched similar initiatives. Sweden’s SSAB last year produced what it claims was the world’s first fossil-free steel via green hydrogen. Australia’s Rio Tinto is conducting trials in which sustainable biomass is the reducing agent.

Per tonne, green steel costs about double that of conventional steel, according to Wood Mackenzie. The consultant forecasts the two steel types will reach parity by 2035 in Europe, China and the US, as around \$100 billion is invested in the green steel industry over the next decade.

15

Transform
construction methods

The construction industry is the world’s top consumer of raw materials and a massive source of carbon emissions, so making existing and future manmade structures more sustainable will be key to limiting global warming.

Cement production’s carbon intensity has increased since 2015, with the industry responsible for about 8 percent of global CO₂ emissions. For the past 200 years, cement has been made by heating various materials such as limestone to high temperatures to create a powder known as clinker that sets within one day.

Increasing energy efficiency and switching to renewable or low-carbon energy sources can all reduce cement’s environmental impact, but alternative production methods and different raw materials could have the biggest impact.

There are many variants of ‘green’ cement. Most use industrial waste materials that are mixed together without heating, while new additives can be used to make pozzolanic cement, which has 99 percent lower carbon emissions and was used to build Rome’s Colosseum. Pozzolanic cement also sets as quickly as its modern equivalent.

Today’s buildings create up to 70 percent of a city’s carbon emissions, and two-thirds of existing structures will probably still be standing in 2050, according to property consultants JLL.

Retrofitting buildings to boost energy efficiency is vital. “UK homes are not fit for the future,” states a report by the Committee on Climate Change that calls on all households to be made low-carbon and low energy. Installing LED lighting and upgrading heating, ventilation and air conditioning systems will reduce electricity consumption and running costs, as will wall and loft insulation, and passive cooling techniques such as shading ventilation. For larger buildings, planting greenery on roofs can reduce rainwater runoffs and lower cooling and heating needs.

KEYNOTE INTERVIEW

How real assets can provide real solutions



Real asset investments play a key role in the journey to net zero, says Manulife Investment Management's [Christoph Schumacher](#)

How can asset managers invest sustainably for a better world? And how can investments in real assets contribute to meeting investors' climate change goals? In this Q&A, Christoph Schumacher, global head of real assets for private markets at Manulife Investment Management, expands on the integral role of real assets in the finance industry's collective drive towards net zero.

Q Why are investors looking to real assets to help mitigate climate change?

I believe there's a combination of factors at work. Investors in real assets – whether transportation networks, net-zero buildings, renewable power generation or sustainable agriculture

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– can quantify their carbon emissions in a tangible way. This is critical, because we are seeing growing demand for greater corporate transparency and stakeholder accountability, and regulators across the world are accelerating their interest and enforcing stricter sustainability guidelines. Investors can be confident that investments in real assets represent a route to net zero.

We're also seeing more partnerships between scientists, the academic community and investment teams. These are essential to implementing,

recording and measuring our progress, and ensuring the effective integration of sustainability into the footprint of portfolios. They also help to satisfy clients who are asking more and more demanding questions about our climate mitigation and adaptation measures.

Investors are keenly interested in learning how real asset investments can help them achieve their climate goals. They're asking how we integrate our principles into our everyday, on-the-ground operations; how we measure our success, using credible, internationally agreed, standards; and how we engage with other companies to improve their sustainability.

And finally, real assets tend to be less vulnerable to unexpected changes

in inflation, consumer preferences and global growth than more cyclical financial assets. In times of uncertainty, these assets, especially when located in North America, Australia or New Zealand, can offer protection.

Q Can agri and forestry management practices combat climate change?

Sustainable agricultural and timberland investing provides low-cost climate change solutions that also act as a first line of defence for protecting and enhancing biodiversity. According to the World Business Council for Sustainable Development, these cost-effective natural climate solutions represent 37 percent of the opportunity to deliver the emissions reductions needed to limit global warming to 2 degrees Celsius – and are available now.

The ability of forests to capture and store carbon is broadly recognised as one of the most effective and cost-efficient mechanisms available to mitigate climate change at scale. In addition, new approaches like mass timber or cross-laminated timber are increasing the potential usage and benefits of wood-based construction. As a new report in *Nature* confirms, building with wood can reduce greenhouse gas emissions significantly compared to carbon-intensive concrete and steel.

As with forestry, several nature-based solutions exist for agriculture. Incorporating regenerative practices such as cover cropping and no, or low, tillage promote soil health and water storage capacity, which in turn increase carbon storage. Agroforestry blends trees and shrubs with farmland to boost environmental, social and economic benefits, and the amount of grassland conversion avoided is estimated to result in preventing the release of 35 million tonnes of carbon dioxide equivalent per year.

While carbon measurement practices continue to evolve, and more investors and companies begin to explicitly value carbon sequestration and other ecosystem services, we believe carbon

will become a more valuable attribute of both timberland and agriculture. We're developing a platform for investors to be able to make these types of credible, measurable, impact-focused climate and nature investments at scale.

Q How can other real assets help reach net zero?

All real assets provide opportunities to reduce the effects of climate change – especially infrastructure assets, which are critical to society's transition to cleaner energy. And technological advances such as in agriculture infrastructure, are essential to achieving a reduction in the farming sector's carbon footprint. Real estate assets are vital to

“Real estate assets are vital to reducing the built environment's carbon footprint”

reducing the built environment's carbon footprint, and investors will want to see building efficiency improvements, fuel switching, and renewable technology that support carbon reduction goals.

At Manulife Investment Management, our aim is to reduce our Scope 1 and 2 greenhouse gas emissions across the properties in our portfolio that are within our operational control by 80 percent by 2050.

Q How do your teams approach the sustainable management of real assets?

Our approach to sustainable investing rests on integration, stewardship and collaboration. Where we invest and operate assets in our real estate, timberland and agriculture portfolios, we seek to raise the bar of sustainable investing and stewardship while enhancing the value of our assets and having a positive impact on all our stakeholders.

Within infrastructure, we focus on building strong relationships with companies, sponsors and co-investors. This enables a meaningful approach to sustainability and enhances our influence over key assets and portfolio companies. In addition, we contribute to and support several climate-focused collaborative initiatives – we know that managing real assets for optimal carbon sequestration and minimal greenhouse gas emissions is a sophisticated discipline, requiring a holistic approach from an experienced team.

Q How has your experience shaped your approach?

We're long-term investors who are committed to sustainably delivering on our clients' financial objectives and acting as responsible stewards of the assets that we invest in. We believe that real assets are especially critical to providing real answers to society's most pressing challenges, and that investors can potentially benefit from putting their capital to work in a way that generates a positive contribution to society.

We're signatories to the PRI's corporate sustainability initiative, and our real estate capabilities are recognised as a sector leader by GRESB Assessments, where our infrastructure capabilities are also highly rated. And we've worked with the Task Force on Nature-related Financial Disclosures to create reporting standards for biodiversity and natural capital, and with industry peers and non-profits to develop a new sustainability standard for agriculture, Leading Harvest.

One of our goals now is to further reduce the emissions footprint of operations, where we have already achieved net zero. We are also working towards net zero emissions in investments and we're offering a range of sustainable investing options to clients. Furthermore, we believe our vast natural resource holdings make us uniquely positioned in our sector to accelerate the use of nature-based solutions in the fight against climate change. ■

Agriculture and land-use

Mina Tümay investigates how we need to change the ways we use land and produce food

Virtually everyone on Earth depends on agriculture for their survival. The planet could not support a large and growing human population without sophisticated systems for growing crops and raising livestock. Agriculture is also a significant source of livelihoods, employing 27 percent of the world's workforce, according to the UN Food and Agriculture Organization. The vast majority of agricultural workers are found in Asia and Africa.

While the burning of fossil fuels is the leading cause of greenhouse gas emissions, the global food system is another significant driver of the climate crisis. Estimates vary on the level of emissions that derive from food, but a study last year found that food production and consumption was responsible for up to 37 percent of emissions.

Meanwhile, as the global population and demand for agriculture products increases, the demand for fertile agricultural land is larger than ever. Investors are under growing pressure to ensure investments in agriculture and forestry are consistent with the net-zero agenda.

Investors are more interested than ever in alternative practices in agriculture that will help meet Paris Agreement goals and tackle emissions. Many are wary of controversial concepts such as carbon offsetting that have the potential to be deemed greenwashing. But investments in lower-carbon alternative fertilisers and environmentally friendly protein alternatives to meat are on the rise, and several initiatives are being implemented to restore forests and protect the earth's biodiversity.

With COP27 dedicating an entire day to agriculture, the importance of the industry in tackling climate change is finally taking its rightful place at the heart of the climate debate. ■

\$11.1bn Investment in companies producing alternatives to meat in 2021

37% The share of emissions that derive from the food system, according to a study in 2021



High ambitions: vertical farming offers a farming solution closer to urban consumers.

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Invest in alternative fertilisers

Environmental worries and price concerns are increasingly driving investors to look at biological alternatives to traditional chemical fertilisers.

Firstly, fertilisers are produced using natural gas feedstocks, which make significant contributions to greenhouse gas emissions. Especially when used imprecisely and excessively to cater for the global agricultural demand, fertilisers and pesticides deplete the quality of soil and cause dangers for aquatic life. Fertilisers that seep into freshwater ecosystems can cause eutrophication, leading to ‘algal blooms’ that deprive fish and other species of oxygen.

Meanwhile, due to supply chain disruptions and the energy security crisis in Europe, the prices of certain chemicals used to produce fertilisers – such as synthetic nitrogenous fertilisers – have soared, while natural gas used as a feedstock is in short supply. This has further encouraged investor interest in biological alternatives.

According to AgFunder, start-ups focused on developing biological inputs for crops raised \$892 million worldwide in 2021. A greener alternative feedstock that has sparked investor interest is green ammonia, which is 100 percent renewable and carbon-free, and can be made by using hydrogen and nitrogen separated from the air and processed through renewable energy. Although the cost of producing green ammonia via electrolysis currently comes at two to four times the cost of ‘grey’ equivalents, costs are likely to fall over time. Carlyle Group and CIG have recently backed Eneus Energy, supporting its green ammonia projects.

Another solution is ‘precision agriculture’. This relies on systems that collect information through satellite data and remote sensing devices to address inter- and intra-field variability in crops. Precision methods optimise the use of fertilisers and pesticides, reducing their negative impact. They can also optimise irrigation and provide real-time information on temperature, sunlight or soil conditions.

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Produce alternatives to meat

Animal produce is ranked as one of the biggest contributors to global CO2 emissions, with 502 million tonnes of carbon dioxide released each year through livestock in UK and EU farms, according to the Food and Agriculture Organization.

“Cows are the new coal – cows must sit alongside coal and cars at the top of the COP27 agenda if leaders are to leave Egypt with a credible plan for achieving the Paris Agreement,” says Jeremy Collier, chair and founder of the Farm Animal Investment Risk & Return Initiative, and chief investment officer of private equity farm Collier Capital. The animal produce industry is heavily resource-intensive compared to plant-based lower carbon alternatives, while less and less arable land is available globally. There is therefore a growing need for other solutions that satisfy consumer demand and are gentler on the environment.

Data released by the Good Food Institute states that 2021 was a record-breaking year for investment into alternative produce. Cultivated meat and seafood companies, fermentation companies focused on alternative products, and companies specialised in plant-based alternatives secured almost \$11.1 billion in investment capital, 60 percent more than they had in 2019.

The GFI highlights how the public health and environmental crises of 2020 and 2021 heavily influenced this decision. GFI senior investor engagement specialist Sharyn Murray says: “With more and more investors acknowledging that climate risk is investment risk, alternative proteins offer a scalable solution that gets the world closer to a more secure, carbon-neutral food system. Managing climate risks is impossible without addressing food, and agriculture and alternative proteins offer us a tool to do that.”

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Restore forests and ecosystems

The Earth's natural ecosystems provide humankind with almost everything we depend on, from food, water and plants that give us fuel, shelter and medicine, to climate regulation and natural flood defences.

But human impacts through climate change and deforestation are putting ecosystems – and the businesses that rely on them – at serious risk. For natural capital to be restored, planet-conscious investment decisions need to be made. “In these times of crisis for the planet, which individual investor would not want to tell their kids they invest in the Earth's capacity to regenerate life?” asks Alejandro Litovsky, founder and CEO of consulting firm Earth Security. “But despite the hype, nature is not yet an asset class; and carbon markets' impact can be flimsy.”

The World Economic Forum's It.org initiative provides opportunities to make transparent and accountable pledges towards conservation and restoration of the ecosystem. More than 30 companies have pledged to make investment decisions that protect and conserve 4.6 billion trees in around 60 countries.

Companies that depend on the ecosystem for their products are implementing new practices to improve supply chain impacts on biodiversity. “Doing it requires a new mindset – especially in agriculture and real assets – funding and growing companies whose business models are based on ecological restoration,” Litovsky says.

For example, Nestlé has committed to planting 200 million trees by 2030 in and around farms where they source their ingredients. In 2021, Mozambique became the first country to be paid through the World Bank's Forest Carbon Partnership Facility for reducing emissions, signalling to the international carbon markets that reducing emissions from deforestation and forest degradation leads to higher-quality carbon credits.

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Offset emissions?

Carbon offsetting - in which companies increase carbon storage through restoring land or planting trees to compensate for emissions - has long been a controversial concept.

Although an environmentally friendly idea in theory, offsetting becomes detrimental to the net-zero agenda when offsets are used as a substitute for reducing emissions. The Science Based Targets Initiative has warned that an overreliance on offsetting to maintain ‘business as usual’ creates issues around land use, equity, fairness and climate justice.

Despite numerous companies and countries jumping aboard the offsetting bandwagon, many are sceptical that it truly contributes to the net zero path. Offsetting may even be seen as a glorified form of greenwashing. For offsetting programmes to truly contribute to net zero, the credits must not be generated from emission reduction efforts that would have occurred regardless of a company's investment.

Australia has recently appointed the country's former chief scientist to review the country's carbon credits following allegations that they do not add up to emissions reductions. And some companies are rethinking offsetting programmes altogether.

After launching its offset programme in 2019 and becoming one of the first major airlines to claim that it offset all its emissions, easyJet announced in September that it will abandon its carbon offsetting scheme. The company will instead concentrate on other technologies such as fuel-efficient aircraft, greener fuels and hydrogen-powered aircraft. easyJet reportedly offset 8.7 million tonnes of emissions since the launch of the scheme in 2019 and will still give customers the option of voluntarily offsetting with an additional cost.

KEYNOTE INTERVIEW

Supporting agri-food on the road to net zero



INOKS Capital's Nabil Marc Abdul-Massih discusses the role of agri-food investment in achieving net zero

Agriculture accounted for at least a quarter of global emissions in 2021. There is no doubt, therefore, that the agri-food sector has a crucial role to play on the road to net zero. Nabil Marc Abdul-Massih, CEO of INOKS Capital, speaks about the role of agri-food in tackling climate change, as well as how SMEs in emerging markets fit into the big picture.

Abdul-Massih also discusses the availability of data and how pricing affects the ability to implement sustainable, technology-enhanced farming tools and techniques. He stresses that asset managers need to focus on supporting resource-efficient and sustainable agri-food activities in emerging markets.

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Q How can agri-food contribute to net zero?

We'll always need to feed ourselves, so agriculture is a sector that's here to stay. But there are substantial emissions along the various segments of the value chain. The way products are farmed and brought to market around the world always involves a footprint in terms of energy use and emissions.

Simple changes in how food is produced, transported and distributed can make a significant contribution towards net zero. Food needs to be produced more efficiently and sustainably to avoid

expending resources unnecessarily. In certain value chains, up to 25 percent of food is lost or wasted before it reaches the consumer. Mitigating these losses will automatically reduce energy use and emissions on a per unit of consumption basis, which has a multiplier effect towards net zero. Being a catalyst for the development of shorter agri-food value chains also means supporting resource efficiencies. Producing and consuming locally, through circular value chains, is the optimal way to move forward.

Q How can asset managers support agri-food companies towards net zero?

The first thing an asset manager can do is identify what is tangible. The

tangible aspect corresponds to providing capital where it's most impactful: such as specifically targeting companies that are working towards net zero. There are also many intangibles, mostly around the technical assistance that asset managers can put together to support companies in tackling operative and functional challenges.

Two years ago, INOKS Capital launched dedicated technical assistance programmes, along with financial assistance, for some of the small and medium-sized agricultural enterprises that we support in Sub-Saharan Africa and Central Asia. We collaborate with external consultants and development agencies to deliver technical and agronomic training or provide suitable machinery for women co-operatives. We ensure the intervention benefits the investee and is aligned with the sustainable development of the wider industry.

Our technical assistance to portfolio companies helps them assess where they stand within net-zero initiatives, and to define how they can reduce emissions, use their resources better and generate less waste. We also encourage them to become propagators of such approaches.

Q How can SMEs in developing markets be convinced to help tackle climate change?

INOKS encourages farmers to work towards soil regeneration and practice sustainable agriculture. It's a no-brainer to explain to them that by using such farming practices, they benefit from long-term advantages such as avoiding soil erosion and deprivation.

They can be convinced to implement such approaches by explaining that combatting climate change is not some kind of penalty, but something that is part of the quest towards efficiency. The more the SME is efficient and competitive, the better it is equipped for volatile weather patterns, market disruption, and ready to identify and profit from opportunities.

“Combatting climate change is not some kind of penalty, but something that is part of the quest towards efficiency”

One misperception that we hear often is that people in emerging markets aspire to consume as much as they want, because richer economies have had the luxury of doing so for a couple of centuries, and that it's a question of fairness. On the contrary, there are practical conversations that can be had with SMEs around improving business and operational efficiencies, which in turn have positive impacts on tackling climate change. The engagement must educate on climate-related topics while considering the business realities of the SMEs to convince them to adapt.

Q How do you overcome challenges in collecting data in the agri-food sector?

We generate a substantial amount of data through our own research, and all along our investment process, from sourcing to divestment. This data is important in helping us assess the status of the corporates and investees that we work with from different angles. But we also use data to support them along their improvement curve, when measuring results, and in becoming proponents of change.

For the agri-food sector overall, it's much more complicated as the data is often unavailable. International organisations are making substantial efforts to use new technologies in agtech to collect and measure data. Yet data remains a vastly unaddressed need, especially for SMEs across emerging markets.

For example, you may have heard about the upsides of precision farming,

generating statistics on soil usage, using satellite imagery, or deploying AI to automate farm surveying – but these services are not readily available across the board. It's due to the cost, not only of machines like satellites, but also of having professionals on the ground to deploy these services. We need to invest in resources in emerging markets to enable SMEs to access those benefits.

Q What needs to happen to further support and scale impact investments in agri-food?

Supporting impact investments in agri-food requires an understanding at the structural level as well as a mindset shift regarding investment duration. Structural because when investing in agri-food, historically and pragmatically, we refer to investing in emerging markets. And when we talk about impact investing in emerging markets, we talk about private capital being channelled directly to SMEs and larger corporates along these value chains.

In that sense, there are numerous barriers to channelling capital towards emerging markets, especially to companies from the agri-food sector directly. None of the structural players, like banks or regulators, are willing to work on this as it's too costly for them. They'd rather the market invested in places like Europe, the US or Japan. But that's not going to be valuable in terms of agri-food supply chains globally. This represents an enormous structural inefficiency.

The second aspect refers to timing. Investors haven't traditionally been inclined towards investments that take time. They're accustomed to having substantial liquidity at any given moment. Yet, this is where a mindset shift is critical. Impact investors who make a medium- or long-term commitment to sustainable agri-food value chains will reap the benefits. There's a long way to go, but we believe we'll get to a world where agri-food is more efficient and sustainable. ■



Transport

Matt Smith explores the need for investment in green technologies to reduce emissions from cars, shipping and aviation

Fossil fuel-powered transport has remade human societies over the past two centuries, accelerating economic development and giving people greater freedom to travel near and far for work and leisure. Transport is also a major employer, providing 60 million jobs worldwide, and is integral to all economies, representing 7 percent of GDP in the EU and 7.7 percent in the US.

Yet our enhanced mobility has come at a huge cost to the environment, with the transport sector having the highest reliance on fossil fuels, according to the International Energy Agency. In 2019, the industry was responsible for 27 percent of the UK's net greenhouse gas emissions and for 29 percent of those from the US, for example.

Following a brief slump in 2020 when the covid-19 pandemic was at its peak, annual global transport sector carbon dioxide emissions rose by 8 percent year-on-year in 2021. This must fall by at least one-fifth by 2030 to get on track to achieve net zero, the IEA warns.

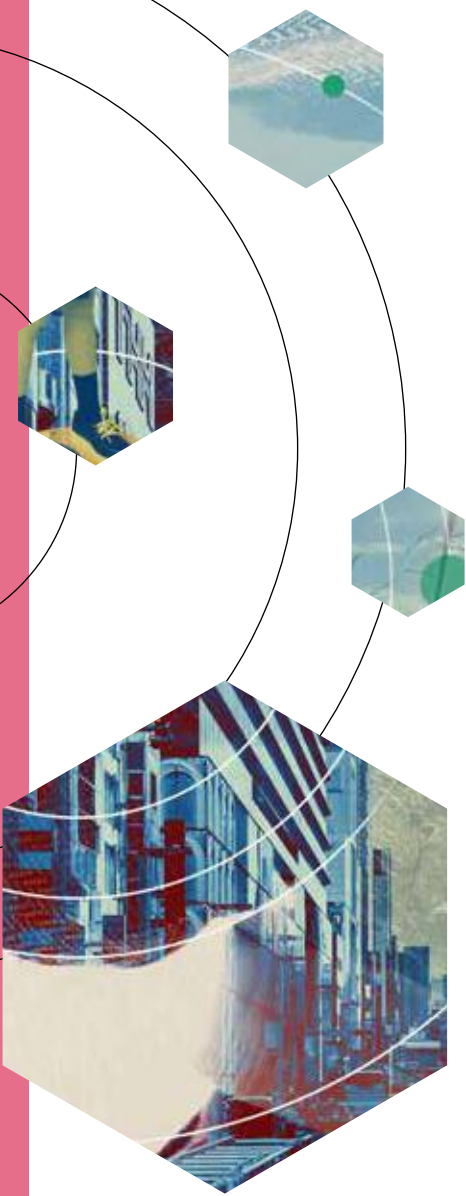
Yet reinventing transport for a post-carbon society also offers vast scope for innovative businesses to prosper. Annual revenue from the electric vehicle market will grow at a compound annual rate of 29 percent over the 2020-30 period, from 2.5 million to 31.1 million units, Deloitte forecasts.

Production of hydrogen – a carbon-free energy source if made without natural gas or coal – will more than double to 223 megatonnes by 2050, Wood Mackenzie estimates, describing the element as a \$600 billion investment opportunity.

Technological breakthroughs to develop alternative fuels for shipping and aviation will enable these major industries to go green – provided policymakers implement the necessary incentives and taxes to achieve price parity with fossil fuels in the long term. Together, the private and public sectors can reinvent transport to both increase mobility and slash greenhouse gas emissions. ■

62% Year-on-year rise in electric vehicle sales in the first half of 2022

\$190bn Expected size of the EV charging market by 2030



Charging to the future: the expansion of electric vehicles will be vital to reducing emissions from transport. But affordability and the availability of rapid charging will pose bumps in the road for the EV industry.



20

Accelerate the electric vehicle revolution

Electric vehicle sales are soaring and by 2025 should represent nearly one-quarter of all new passenger vehicles on the road worldwide that year. However, high purchase prices and slow charging times will continue to deter many would-be buyers.

In the first half of 2022, 4.3 million electric vehicles – battery and plug-in hybrids – were sold globally, up 62 percent year-on-year, according to the EV Volumes database. Over half of these sales were in China, where EV purchases more than doubled. By 2025, petrol and diesel passenger vehicle sales will be 19 percent below their 2017 peak, BloombergNEF forecasts.

Public subsidies, totalling \$30 billion in 2021 – double that of the preceding year – are key to greater EV adoption, according to the International Energy Agency, which estimates the market for electricity charging will be worth \$190 billion annually if EVs represent 30 percent of all vehicles sales by 2030. That's about one-tenth of the current petrol and diesel market and would account for around 4 percent of global electricity demand; although achieving this level of EV adoption would require a nine-fold increase in the number of public chargers.

Battery limitations are another major obstacle to mass EV adoption. Simply put, we need batteries that are cheaper, lighter, last longer, and charge quicker. EVs rely on essentially the same lithium-ion battery technology as mobile phones and laptops. Most public charge points deploy higher voltages to fully charge in four-10 hours. Direct-current fast charging can go from 0-80 percent charge in less than an hour, but is

problematic with lithium-ion batteries because a side effect is lithium plating, which can cause battery failure.

“The key issue is to understand the behaviour of electric vehicle owners – at least 90 percent prefer to charge in their own homes, so there's not a big incentive for utilities to build huge public charging infrastructure,” says Ashwin Kumar Balaji, senior energy analyst at Daymark Energy Advisors. “If you want wider EV adoption, you need to have infrastructure that supports fast charging and also a battery that can be fast-charged.”

EV prices are another hurdle. In Europe and the US, battery-electric cars cost 45-50 percent more than a similar conventional vehicle, according to the IEA – although many experts forecast battery EVs will reach parity in terms of total cost of ownership (including running costs) by 2026 at the latest.

Heavy-duty vehicles are the source of around one-quarter of road transport's greenhouse house gas emissions in the EU. For long-haul trucks, batteries are impractical because their large size would reduce the vehicles' payload. Hydrogen fuel cells, which are lighter, take up less space and, in theory, refuel as quickly as a conventional visit to a petrol station, seem more viable for large vehicles. A 2020 EU report predicts 17 percent of all new trucks sold in 2030 – 59,500 units – will be powered by hydrogen fuel cells.

“If you want wider EV adoption, you need to have infrastructure that supports fast charging and also a battery that can be fast-charged”

ASHWIN KUMAR BALAJI
Daymark Energy Advisors

21

Set sail on
green shipping

The maritime sector emits more carbon dioxide than aviation and is also a major source of sulphur oxides and nitrogen oxides, which are hugely harmful to the environment too.

Reducing shipping's reliance on heavy fuel and diesel will require multiple solutions tailored to differing vessel sizes, as well as regulatory reforms. The International Maritime Organization aims to cut international shipping's greenhouse gas emissions by at least 50 percent by 2050 versus 2008 levels, while by 2025 all new vessels must be 30 percent more energy efficient than those built in 2014.

Dutch company Future Proof Shipping is building a fleet of zero-emission craft for inland waterways. The retrofitted vessels will run on hydrogen fuel cells, with the first due to launch in late 2022. To be net zero, the boats will use green hydrogen made from renewable-electricity powered water electrolysis. "Alternative fuels like hydrogen occupy a much larger volume than fossil fuels, thereby requiring more on-board storage space," says Milinko Godjevac, Future Proof Shipping's senior integration adviser.

"Compressed hydrogen could be a solution for some short sea vessels depending on the location, type of vessel and operation. Liquid hydrogen, other hydrogen carriers or e-fuels are more suitable for vessels and routes beyond a certain scale."

Green ammonia, which is made from green hydrogen, perhaps offers the most promise for ocean-bound craft. Germany's MAN Energy Solutions will launch an ammonia ship engine in 2024 and plans to begin retrofitting existing vessels the following year.

Britain's Smart Green Shipping has touted another solution: so-called FastRigs, which are sails that can be added to ships with sufficient deck space such as bulkers and tankers. A government-funded feasibility study found the rigs could reduce fuel consumption by 20 percent.

22

Let green aviation
take flight

Numerous celebrities and world leaders have been branded carbon criminals for their flagrant use of private jets - a charge that is sure to be heard again when COP27 kicks off in Sharm el-Sheikh.

Aviation is responsible for 2.1 percent of global carbon dioxide emissions. Switching to sustainable aviation fuels (SAF), which can be blended with kerosene and used in standard aeroplane engines, is the most plausible route for commercial airlines to reduce their environmental impact, since, at present, batteries' weight and size make them unsuitable for planes carrying more than about six people.

There are two main types of SAF: biofuels and synthetic fuels. Biofuels are made from the likes of fats, oil, grains, and algae and solid waste, but insufficient supplies of these raw materials make synthetic fuel – also known as e-kerosene – the most promising long-term bet.

Produced by combining carbon dioxide captured from the air and hydrogen created by renewable electricity-powered water electrolysis, e-kerosene is near carbon-neutral and can be blended at up to 50 percent of total fuel according to current regulations. That limit could increase to 100 percent eventually.

Estimates vary, but e-kerosene costs anything from double to six to nine times that of conventional kerosene depending on carbon prices.

"Blending obligations or fuel incentives/standards can help overcome this barrier and are paving the way for commercial facilities," says Oskar Meijerink, senior project lead at Netherlands' SkyNRG, which sources, blends and distributes SAF to more than 40 airlines worldwide. "Good and stable long-term policies can help create the market and allow investments to flow into the SAF industry."

In 2021, the European Commission introduced blending mandates for e-kerosene of 0.7 percent by 2030, increasing to 28 percent in 2050 for flights within the EU.

KEYNOTE INTERVIEW

Navigating regulatory risk on climate



Investors need to stay on top of a fragmented and rapidly changing reporting and disclosure landscape, says [Martina Macpherson](#) from SIX

Adhering to standards on emissions and ESG was once voluntary for investors. Recently, however, climate and transition risk management – as well as ESG disclosure frameworks – have moved to the top of the global regulatory agenda. ESG compliance has therefore increasingly become subject to rules-based approaches.

However, the specifications for climate risk management differ between jurisdictions, presenting challenges for investors looking to navigate global markets. Martina Macpherson, head of ESG product management at SIX, explains how understanding, interpreting and mapping key ESG regulatory risk requirements is becoming a prerequisite for data and services management.

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Q How is ESG regulatory risk management changing?

We've identified regulatory risk management as one of the key market drivers for ESG because regulatory data and services are becoming a prerequisite for investor clients. We have just finished a strategic survey and it's clear that investors face new regulatory reporting challenges. But there is still a lack of understanding of the relevant ESG reporting infrastructure and operational systems, especially on the asset management side. According to our survey, the biggest gaps remaining are

in automated, end-to-end regulatory risk management solutions.

Regulatory risk challenges are ever-changing, so it's a very fragmented landscape. At SIX, we take an aggregated approach by looking at all types of frameworks within the regulatory environment. We see clear developments around ESG regulation and there's a trajectory for normative frameworks, such as the Task Force on Climate-related Financial Disclosures, to move into the regulatory sphere, becoming mandatory standards.

Consequently, there are potentially areas where investors need to disclose information and align with specific taxonomies or thematics. Relevant thematic regulatory areas for ESG include

climate risk, and an increasing focus on human rights and labour rights, in the context of modern slavery regulation and supply chain management oversight. There's also increasingly a focus on sustainable finance in capital markets, and prudential climate risk regulation, which will have major implications for investors and the broader capital markets.

Q How do jurisdictions differ in their approach and what are the implications?

Climate risk regulation, based on the TCFD, is being rolled out around the world and climate risk management is aligning to a large extent across jurisdictions. The overarching, TCFD-aligned ambitions of, for instance, carbon emission reduction, and risk and opportunities management for climate change mitigation and adaptation, are fundamentally the same. However, each jurisdiction has certain nuances where climate risk assessment criteria, scenarios and time horizons for Paris and/or net-zero alignments are concerned. Hence, understanding and mapping portfolios to ensure compliance with local regulation – for example in the climate risk management domain – is becoming a key investment management challenge.

The need for further alignment, especially around something as important as TCFD and climate risk and opportunities management, is becoming increasingly clear. In the UK, the Financial Conduct Authority (FCA) is focused on staying as close as possible to international developments in its work around TCFD disclosures for large-cap listed companies, public-interest companies and public pension funds. There has been close collaboration with the International Platform for Sustainable Finance, as well as with International Organization of Securities Commissions (IOSCO), around ESG and climate risk disclosures, metrics and frameworks. And the FCA is trying to align with the major trajectories coming out of the

US, where we see the Securities and Exchange Commission's (SEC) proposal for major public-interest companies to disclose climate-related risks.

Despite global standard setters focusing on harmonising global ESG reporting frameworks, we still see a lot of pluralism. There's a need for mapping to bring more clarity, comparability and consistency of ESG and climate risk information.

“Tech is becoming indispensable for ESG”

Q How is the market adapting to these changes?

Investors are increasingly looking for end-to-end solutions, covering ESG data management, analysis and reporting, as well as portfolio exposures. Technology can play a big part in this.

When it comes to ESG, you see technology enabled solutions for analysis, attribution analysis and analytics. Tech is used throughout the whole value chain from data collection to data triaging, management, monitoring and reporting for regulatory purposes. On the other side of the equation, there are alternative data sets, digital data catalogues and geospatial data, as well as AI, machine learning. There are also efforts such as the green wallet initiative to utilise blockchain for green bond verification systems. Tech is becoming indispensable for ESG.

We're moving away from traditional rating data sets towards more specialist ESG data, across different asset classes and thematic. Technology underpins the triaging and mapping of data sets and enables an end-to-end workflow. It also helps by providing underlying analytics to support investment at a corporate and, increasingly, at a capital markets level.

What does it look like in the markets? We're seeing accelerated growth

in ESG technology through targeted acquisitions, strategic partnerships and marketplace models in line with these changes. There are end-to-end capabilities and models that are driving the analytics in this market. We're focusing heavily on this area to identify solution providers we can partner with to define and calculate green revenue streams and ratios.

Q How do you see ESG regulatory risk management developing?

Alignment, standardisation and harmonisation between materiality approaches and the underpinning frameworks and taxonomies must continue. There's significant alignment around the EU Sustainable Finance Action Plan, because to distribute and sell a fund product in Europe you have to comply with the plan's regulations. So, I think global managers are moving towards the scenario where this will become a baseline.

Then there is the International Sustainability Standards Board (IFRS/ISSB), which is working to develop a global baseline for disclosure in sustainable finance. These requirements will also have implications and will require some type of alignment further downstream regarding investor reporting and disclosures. And finally, IOSCO is developing a global standard for sustainable finance due out at the end of this year. This will have a particularly strong trajectory in emerging markets.

These are the frameworks that might be most relevant in some shape or form for investors, as well as potentially capital markets. Alignment with these frameworks should happen within the next 10 years or so. But on this journey, we now need the right type of platforms for engagement and interaction. This has to happen at a supranational level, and I think that is the main challenge at this time. It's an interesting space to watch – and it is very exciting to be part of some of these developments from ESG to RegRisk to RegTech. ■

Circular economy

*Getting to net zero requires a shift away from the wasteful consumption of the Earth's resources, writes **Steve Cotterill***

Getting to net zero will involve more than simply substituting emissions-intensive technologies with greener alternatives. If we continue with the same rates of population growth and consumption that we have now, we will need 2.3 planets' worth of resources by 2050 just to maintain current levels. Five Earths would be needed to satisfy the global need for resources every year if everyone lived like people do in the US. These are the stark warnings calculated from the annual *National Footprint and Biocapacity Accounts* produced by the Footprint Data Network.

One potential solution to this devastating scenario is to reimagine the global economic infrastructure and rethink how we design, make, transport and use the things we need, from the food we eat to the clothes we wear. By recycling and remanufacturing, industry can start to align with global net-zero targets.

The Ellen MacArthur Foundation defines the circular economy as a "systems solution framework that tackles global challenges such as climate change, biodiversity loss, waste and pollution". Its founder, former yachtswoman Ellen MacArthur, explains: "A circular economy decouples economic activity from the consumption of finite resources. It is a resilient system that is good for business, people and the environment. Surely there is a way where we can build our economy by design from the outset so that it could be regenerative and restorative for the long term."

What's exciting, she says, is that there has never been a better time than now to make it happen. "There has been an incredible momentum building over the last few years with extraordinary take up from businesses and governments. We still have a long way to go, but we have seen change at a pace we have never seen before." ■

5 The number of Earths that would be needed if the world population shared the lifestyle of people in the US

141 million tonnes The amount of plastic packaging produced globally every year



No time to waste: solutions are urgently needed to reduce wasteful consumption and strengthen re-use and recycling.

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Tackling food waste

According to a recent ISS ESG report, current food processes account for one-third of global greenhouse emissions. A circular scenario for food, claims the Ellen MacArthur Foundation, could reduce annual CO2 emissions of the food system by 49 percent.

Not only is the industry a massive polluter, it is also extremely wasteful, with non-profit organisation WRAP claiming that more than a third of all food produced globally goes to waste.

Yet very few companies are looking to introduce initiatives to help reduce food waste. ISS ESG's latest corporate ratings around sustainability found that only 25 percent of food producers, restaurants and manufacturers have a strategy to minimise wastage. "The impact that this industry has on the environment and society is vast and significant," says Mirtha Kastrapeli, executive director at ISS ESG. "This makes it a perfect industry to think about applying circular economy principles."

Kastrapeli explains that the areas where investment is having the most impact are among companies that have employed regenerative agricultural practices, and that rely on organic rather than synthetic fertilisers. "We are also looking at greater crop variation or crop rotation instead of relying on monoculture that can have very negative impacts on the environment," she says. "When it comes to reducing food waste, it is about strategies that allow for a better match of supply and demand."

Another focus for investment is on using food byproducts as ingredients and using food waste to generate energy to reduce overall methane emissions. Kastrapeli adds: "These transformations are hard; we recognise that they require a lot of investment, innovation and collaboration. But we are hoping that we will see a greater adoption of these practices."

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Increasing sharing

A seemingly simple way to reduce carbon emissions and cut down on waste is to share resources. It is something that can be done at both a corporate and individual level and across a range of industries.

Some of the greatest strides in this field are being taken in the transport sector, with a slew of networks, apps and services providing lift-sharing. Organisations such as Liftshare, Scoot and Jambusters operate a variety of models to facilitate shared travel or create transport hubs where people can exchange information and plan journeys.

Collaborative Mobility UK (CoMoUK) is the national charity dedicated to the social, economic and environmental benefits of shared transport. It works collaboratively with public, private and third-sector organisations, conducts research and advises public authorities on shared transport and sustainable transport more broadly.

Richard Dilks, chief executive of the charity, says: "Greenhouse gas emissions from road transport currently make up around a fifth of the UK's total emissions, and transport is the largest-emitting single economic sector. Shared transport schemes help to reduce the overall number of vehicles on the road network, and encourage active travel such as walking, wheeling and cycling, while supporting the UK's net-zero ambitions."

According to Dilks, bike-share schemes across the UK reduce car mileage for each user by an estimated 3.7 miles every week, while the number of active car club members in the UK almost doubled last year – taking more than 116,000 privately owned vehicles off the roads. "Changing the way people move around is key to delivering net zero, and ambitious targets on climate change won't be met without investing in and promoting shared transport."

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Establish a right to repair

For decades, rampant consumerism has been one of the major drivers of economic growth, with the constant creation of new devices and appliances replacing older versions well before their usefulness has expired.

This, of course, is unsustainable and a massive contributor to carbon emissions. The Right to Repair campaign involves a set of policy demands by the repair community that asks legislators for binding regulations to make products more repairable and longer-lasting – starting with electronic devices and electrical appliances.

The key aspects are: designing products so that they are easier to disassemble for repair; making all spare parts as well as comprehensive repair guides available to both professional repairers and the general public; ensuring long-term software and security support; and making repair affordable by reducing the cost of spare parts as well as developing other fiscal incentives.

“This is important because electronic waste is one of the fastest streams of waste globally, and the current level of consumption is simply unsustainable,” says Ugo Vallauri, co-director of the Restart Project, a lobbying, education and awareness charity, and founding and steering member of the European Right to Repair Campaign.

“People are increasingly frustrated with throwaway products,” says Vallauri. “We contribute insights from data by community repair initiatives on major barriers to repair, and how to remove them. For most products, the vast majority of the environmental footprint occurs at manufacturing stage. Therefore, extending the useful lifetime of products as much as possible is essential. For instance, 79 percent of a smartphone’s environmental impact in CO2 equivalent occurs before it’s ever been switched on.”

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Closing the loop on packaging

Although gaining some traction among consumers with companies such as Hisbe and Abel & Cole making headlines, ‘zero packaging’ is still relatively nascent on the high street and in supermarkets.

According to WRAP, a climate action non-governmental organisation, we produce around 141 million tonnes of plastic packaging a year globally. Around a third of all plastic packaging put on the global market leaks from collection systems, polluting the environment, while plastic production, use and disposal contributes about 1.8 billion tonnes of carbon emissions annually. Of the 16 million tonnes of plastic packaging waste generated in the EU, only 30 percent gets recycled.

MiWa is a Czech tech company aiming to streamline and decarbonise the consumer process by moving it from buying to renting packaging. Executive director Mirek Lizec explains: “We have created a circular system of reusable capsules, which, by using smart technology, are adaptable for the logistics of today’s supermarket chains. Our mission is to make waste-free shopping a new standard. Why? Because we believe that only a solution applicable to a wide range of retailers can make a true impact on the environment.”

With the product range still at pilot stage, Lizec says the key to more widespread use is for retailers and brands to convince consumers they are taking zero packaging seriously. “We have to remove the barriers to access for consumers and make the circular process convenient. It helps producers and retailers engage with the circular economy as there is zero packaging throughout the value chain.”

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Ramping up
recycling and remanufacturing

Recycling is probably one of the most prominent features on the circular economy landscape; something that touches everyone in their everyday lives. Yet the infrastructure for recycling in the UK and around the world still has major inefficiencies.

“There are a number of different challenges to recycling,” says Fidelity International portfolio manager Alexander Laing. “There are technological, behavioural and economic challenges and all three impact every part of the supply chain. Clearly, the economic driver is to pursue cheaper and non-circular products. Plastic is very cheap for its weight and durability. Carton board or aluminium packaging is not economic and companies are not going to adopt them if it’s going to lead to compression of their margins.”

Investors, suggests Laing, must understand there is a cost to pursuing sustainability and that in the short term there will be challenges. “Whether it is about scaling up industries or driving costs down, moving towards a more sustainable world won’t necessarily come for free.”

Although integral to a sustainable framework, recycling is only one segment of a much wider process of integration and remanufacturing that a fully functioning circular economy envisions. “People often consider the circular economy to be an end-of-life consideration; when you have used your plastic or packaging, you recycle it,” Laing says. “It is certainly a large part of it but in my view, that’s a relatively narrow definition. A genuine circular economy requires a new paradigm, not simply improving the existing linear model. The idea is to eliminate waste at every point of the value chain.”

It is not only in recycling where we need to shift the dial, but also

throughout the manufacturing and delivery process, says Laing. “The goal is to make manufacturing as efficient as possible to ensure there’s limited waste, and to extend the life of products as much as you possibly can,” he says. “From an investment perspective, that spans sectors, markets, size of companies, technologies, and even business models. We need to look at companies that are bringing circular principles into their businesses either as adopters, enablers or beneficiaries.”

Remanufacturing is part of this, where recycled materials or repaired parts are reused to rebuild a product. The manufacturing industry is a major consumer of material and energy, as well as a significant source of waste.

Remanufacturing has proven benefits in material, emissions and financial terms, but its scope requires expansion in existing and new product areas.

David Fitzsimons, director of the European Remanufacturing Council, says: “The important thing about remanufacturing is that it is an industrial process that can be standardised at scale. It is not just material recycling; it is keeping a product or component in life for longer. Most remanufacturing is currently in the business-to-business world. The real challenge is to move that into the business-to-consumer world. That is the way we really will be able to normalise remanufacturing as part of the lifecycles of products.”

“A genuine circular economy requires a new paradigm... The idea is to eliminate waste at every point of the value chain”

ALEXANDER LAING
Fidelity International

“Cows must sit alongside coal and cars at the top of the COP27 agenda if leaders are to leave Egypt with a credible plan for achieving the Paris Agreement”

Jeremy Collier, founder of the FAIRR Initiative, demands action on meat-based emissions

“We have kept 1.5 degrees within reach. But, its pulse is weak. And it will only survive if we keep our promises”

COP26 president Alok Sharma at the conclusion of the Glasgow summit

“Surely there is a way where we can build our economy by design from the outset so that it could be regenerative and restorative for the long term”

Ellen MacArthur calls for a new economic model based on circularity

The last word

Reflections on the urgency of the net-zero challenge as the world prepares for COP27

“Climate change is a threat to human wellbeing and the health of the planet. Any further delay in concerted global action will miss a brief and rapidly closing window to secure a liveable future”

IPCC report author Hans-Otto Pörtner on how time is running out

“Relying on speculative technologies that prolong the use of fossil fuels and purport to deliver emissions reductions... will cost lives and inflict further irreversible harm”

Nikki Reisch of the Centre for International Environmental Law dismisses carbon capture technology

“Energy efficiency solutions are not always the flashiest, but they are critical to achieving net-zero carbon emissions”

Michael Albrecht of Ridgewood Infrastructure on the role of energy efficiency in reducing emissions

“It’s become apparent that some who made impressive pledges did not immediately begin to put in place a practical plan to fulfil those pledges”

Former US vice-president Al Gore warns financial institutions are struggling to put promises into practice