

SUSTAINABLE INNOVATION

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CARBON CAPTURE

To have and to hold

In the run-up to the UN climate summit in Glasgow, carbon capture and storage is emerging as a crucial technology in the effort to arrest global warming

Peter Archer

After a slow start, the UK is set to accelerate its carbon-capture initiatives, with the government aiming to position itself as a world leader in this field by as soon as November, when the UN is due to hold its COP26 climate conference in Glasgow.

The plan includes growing more trees; restoring peatlands, which are big absorbers of CO₂; and developing technologies such as carbon capture and storage (CCS).

Expert groups such as the Climate Change Committee, an independent public body that advises the government, concur that the world will not hit its net-zero targets for carbon emissions without the help of CCS.

"The committee has consistently stressed the importance of CCS in achieving net zero," says Tom Dooks, communications officer at the Climate Change Committee. "For industries such as cement production, it's the only viable technology for reducing emissions to the extent that's required. All credible pathways through which the UK could reach net zero domestically involve a significant role for CCS, especially for greenhouse gas removal, to help offset some of the emissions from those sectors where abatement will be most difficult."

The technology can be used to extract CO₂ from industrial processes or directly from the air and transport it to be stored deep underground, where it cannot contribute to global warming.

"CCS potentially has a big role to play in several applications by 2050," Dooks says.

"These could include the removal of greenhouse gases, the production of hydrogen and the generation of power. While global progress has been slow, there are now 43 large-scale projects in operation or under development around the world."

The UK has CCS projects at the planning stage. These will be based on the Humber estuary and along Scotland's North Sea coast. Shell has started working in the

“The use of renewable energy sources on its own won't get us to net zero, which is why we need carbon capture

latter location with the Storegga Group and Harbour Energy on the Acorn Project. This will initially capture CO₂ from industrial sites in Scotland and store it deep under the seabed. Any gas that isn't stored could be used in the manufacture of plastics, fertilisers, fuels and even fizzy drinks.

Sinead Lynch, Shell's country chair in the UK, believes that CCS will be "vital" in

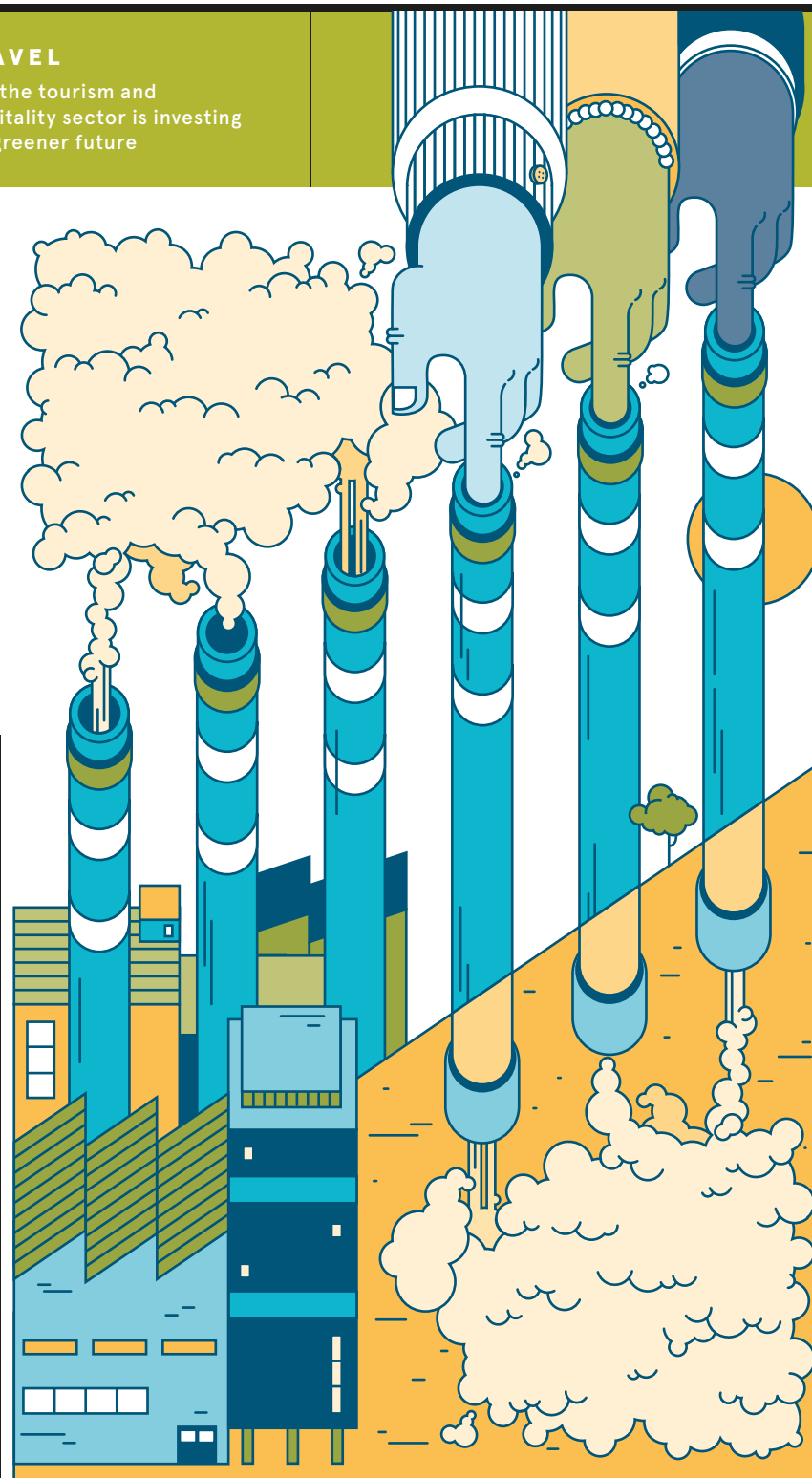
tackling climate change, stressing that the technology enables a producer of fossil fuels to be part of the solution by reducing or offsetting carbon emissions when these cannot be avoided.

"CCS is not an option but a necessity to address climate change," she says. "We do need to ramp up investments in this technology. There is no doubt that the scale required ranges from large to huge. The use of renewable energy sources on its own won't get us to net zero, which is why we need carbon capture."

Dooks notes that achieving carbon neutrality will "require new infrastructure to be built. This must be a partnership between government and business. CCS can benefit the national economy, especially by levelling up areas across the country. The government will need to lead on infrastructure development and offer long-term contracts to encourage investment in carbon-capture plants."

For instance, the government has provided £250,000 in funding for Sizewell C, the planned nuclear power station on the Suffolk coast, to develop technology that will remove CO₂ directly from the atmosphere once the plant is up and running as expected in 10 years' time. The project is being developed by a consortium including CCS experts from the University of Nottingham, Atkins, Strata Technology and Doosan Babcock.

Professor Colin Snape, director of the university's Energy Technologies Research Institute, believes that the use of CCS in



the UK will focus on heavy industries and the production of gas – if gas remains a significant part of the country's energy mix.

"CCS has to feature on the agenda at COP26," he says. "If gas does stay in the mix, it will need to be decarbonised. But industrial processes emit huge amounts of CO₂ as well, so CCS could be playing a significant role in those by 2040."

Snape adds that the main problem with CCS projects is that they are "huge, requiring a lot of money up front to build the plant and pipeline". But he suggests that it should be possible for industrial clusters to pool their resources and share infrastructure.

Dooks agrees. "Developing regional CCS clusters will be the first step," he says. "To enable that, there will need to be appropriate incentives – and the government is working on a series of them to support different parts of the chain."

The first of these, known as the CCS transport and storage regulatory investment model, will fund the development of shared infrastructure, Dooks explains.

"There will also be a series of business models to support CO₂ capture from different sources: industrial, power generation and hydrogen production," he says. "Such incentive models will need to be finalised and contracts awarded before companies can make their final investment decisions and get started on any construction work. The government recently took its first step towards awarding these with an 'expression of interest'."

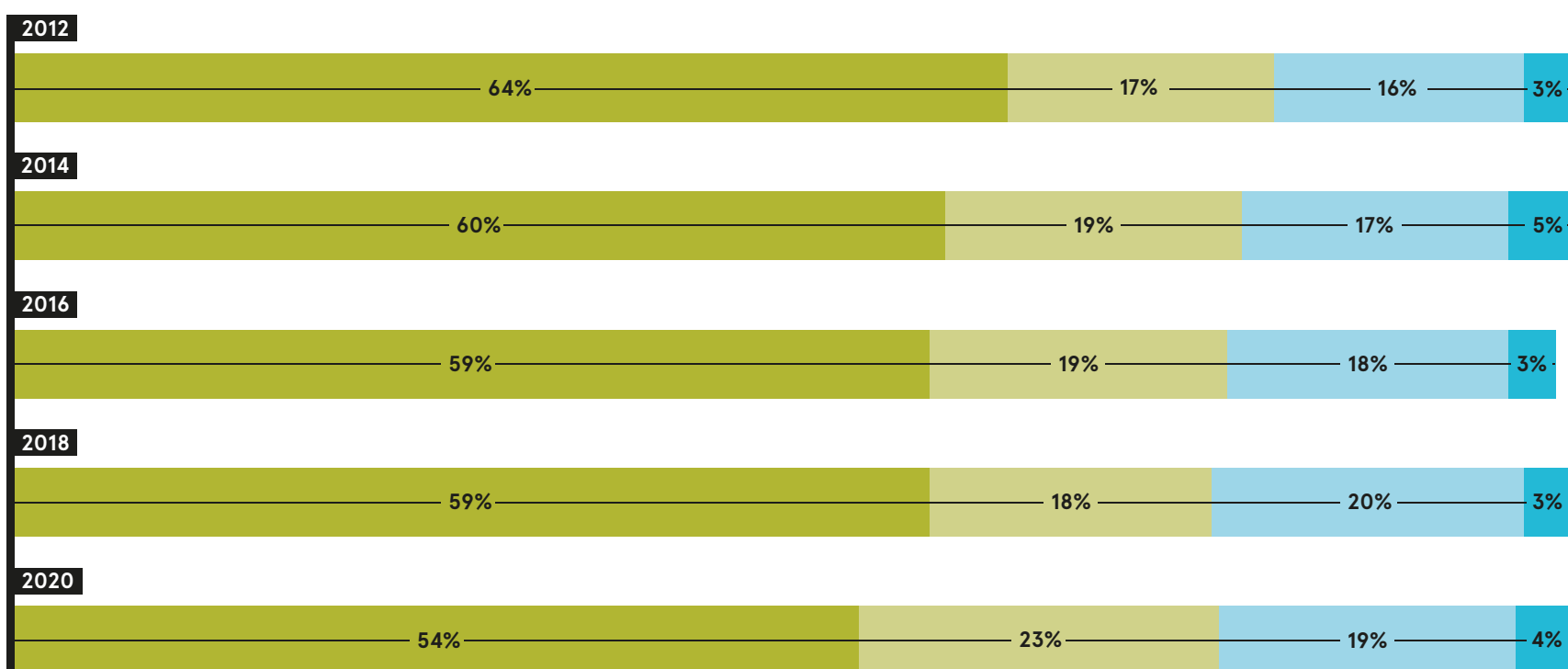
Although it has yet to activate a single CCS facility, the UK is already sharing technical knowledge with a number of countries and also the EU, according to the Climate Change Committee. Its activities include: leading an international working group to expedite the deployment of CCS; participating in Mission Innovation, a global R&D initiative focusing on clean energy; and collaborating, via the UK CCS Research Centre, with equivalent groups in Australia, Canada, China, the Netherlands, South Korea and the US.

"COP26 will oblige the UK to demonstrate its credibility to the world, but it can be the chance to lead the world towards net zero," Dooks says. "This will require many technologies – including CCS – to be discussed and knowledge to be shared."

AWARENESS OF CARBON CAPTURE REMAINS LOW IN THE UK

The percentages of Britons who answered in the following ways to the question: how much, if anything, do you know about carbon capture and storage? (Owing to rounding, numbers may not add up to 100)

● Never heard of it ● Aware of it, but don't really know what it is ● Know a little about it ● Know a lot about it



Department for Business, Energy and Industrial Strategy, 2020

Distributed in

THE SUNDAY TIMES

Published in association with

UPLINK WORLD ECONOMIC FORUM

wbcscd

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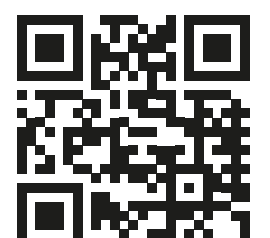
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TRAVEL

Grounded in reality

Taking advantage of the pause in long-haul travel to assess the state of the industry, innovators are exploring ways to make tourism in the Covid era more sustainable

Rebecca Hallett

As the Covid-19 pandemic sent the world into lockdown and put the brakes on travel, the environmental side effects were undeniably beneficial. Air pollution in cities fell dramatically, for instance, while fish could be seen in Venice's canals again. And, with tourism accounting for at least 5% of the world's greenhouse gas emissions in 2019, according to the UN World Tourism Organization, it is clear that certain forms of transport are incompatible with the sustainability agenda. But borders are reopening and international travel is resuming, so what's to be done?

Even before Covid halted long-haul travel, consumer interest in sustainability was increasing. TUI Group reported an 84% increase in the number of its clients choosing "greener and fairer" holiday packages between 2015 and 2020, for instance.

Observing this trend, Cat Jones founded no-fly travel company Byway in March 2020. "Even before the pandemic, there was a surge in consumer consciousness and the number of businesses being built on sustainability," she says. "With the first lockdown coming, I knew that, if there was ever a time to give people a travel experience grounded in the fact they aren't flying, this was it."

Japan is one of many markets where the eco-travel sector has yet to make much headway, but younger consumers are becoming increasingly concerned about sustainability issues, reports Kenji Itakura, deputy sales director at the Tokyo Hotels Group. With an eye on attracting millennial travellers in particular, his firm is implementing sustainability practices throughout its property portfolio and adopting new technologies.

The Kawasaki King Skyfront Tokyo Rei Hotel is the world's first 'hydrogen hotel', for instance, generating all of its energy from waste plastic and food. Itakura notes that it was developed as part of a project started by the Ministry of the Environment in 2015 "to combat pollution and make effective use of hydrogen energy".

This kind of public-sector backing is vital for continued innovation in travel. As Byway builds the complex dynamic packaging technology that will underpin its product, it has been supported by a £100,000 Innovate UK grant, which Jones describes as "exceptionally useful".

Alexandra Pastollnigg is the founder of Fair Voyage, an online travel agency specialising in socially and environmentally responsible trips to lower-income countries. She believes that Covid has offered the industry "a once-in-a-generation opportunity to do things differently", but governments must first lead the way with sustainable development plans and investments.

Travel was already a low-margin, high-competition industry before the arrival of Covid-19. The pandemic has created further pressure, with consumers expecting low prices and free cancellations to tempt them back.

"Local travel agencies, tour operators and travel businesses haven't had customers for a long time and are struggling to survive," Pastollnigg says. "The harsh economic reality is that few consumers can afford to pay a sustainability premium."

Hence the need for government incentives. In the UAE, the Ras Al Khaimah Tourism Development Authority provides a case in point. The authority, established by the government of Ras Al Khaimah in 2011, has used the pause in international travel to strengthen the emirate's sustainability focus.

Marketing itself as 'the nature emirate', Ras Al Khaimah has decided to target socially and environmentally aware travellers and is investing in developments aligned with that goal. The May 2021 announcement of £96m in funding for the sector shows that the emirate is truly "serious about investing in sustainable tourism", according to the authority's CEO, Raki Phillips.

At the luxury end of the market, there is more financial freedom to innovate. For instance, New York business Yuji Yamazaki



Kudadoo Residence via Kudadoo

ECO-TOURISM SET TO BOOM

Market size of the eco-tourism sector worldwide (\$bn)

2019
181.1

2027
333.8

Allied Market Research, 2021

province of Eastern Cape, he says that the focus has been on damage limitation.

In 2018, Mantis and French hotel giant Accor entered a partnership to establish a not-for-profit enterprise called the Community Conservation Fund Africa (CCFA) in their bid to tackle the continent's social and ecological problems. Throughout the pandemic, the CCFA has distributed thousands of food parcels to communities affected by the sharp drop in tourism income. The aim, Gardiner says, has been "to help them through this awful period and also to prevent them from having to poach wildlife in order to sustain themselves".

Alongside this, Mantis has continued investing in innovative business models and initiatives, including the 'Adopt a Beehive' campaign, in which "the CCFA donates hives to local communities, trains people in beekeeping and then purchases the honey to use at Mantis properties".

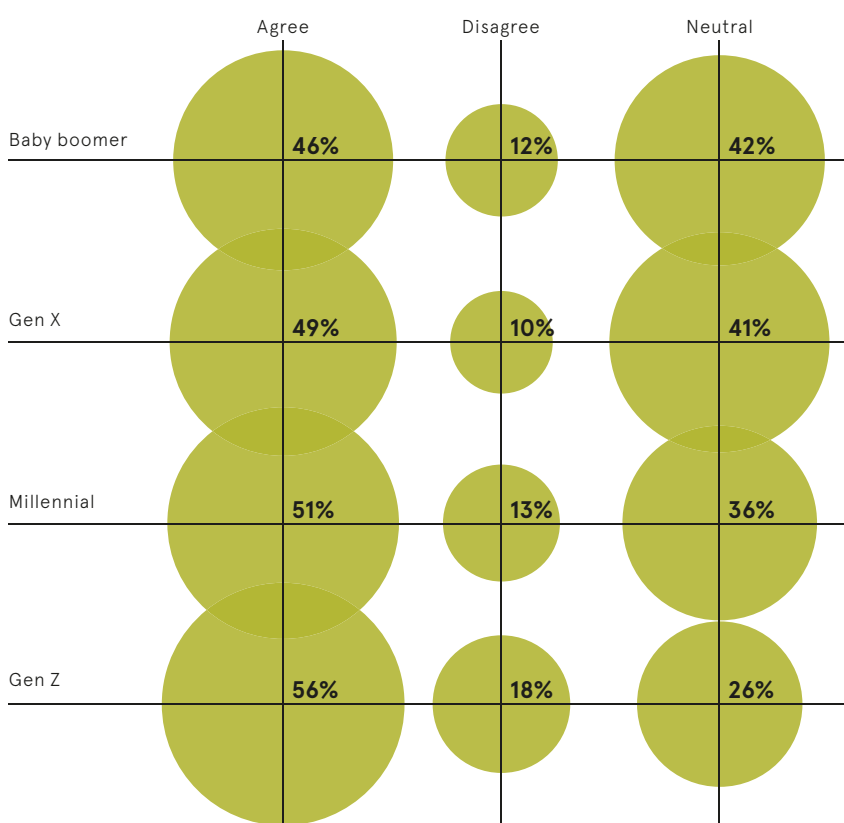
Simon Willmore, chairman of the British Guild of Travel Writers and digital manager at Bradt Travel Guides, says he feels that "many people are expecting a company to produce some sort of technological silver bullet that will enable us to take 20 long-haul flights a year with no environmental impact. That won't happen in our lifetimes."

Instead, he says, there will be more "intangible" innovations, including so-called digital nomad visas. Jurisdictions ranging from Croatia to Bermuda have established these to "allow people to visit new places, but with a 'travel less, stay longer' mantra".

The path towards sustainability in the travel industry is not straightforward, but innovators are helping to chart a course. And they're responding to a clear public interest in sustainable tourism. Yet the real question is: will the travel-starved consumer be prepared, once the Covid restrictions are finally lifted, to put their money where their mouth is?

YOUNGER TRAVELLERS ARE DEMANDING GREENER OPTIONS

Generational breakdown of travellers' responses to the statement: "Choosing an environmentally friendly travel option is important"



Hotel Management, 2020

Architecture designed Kudadoo, a fully solar-powered private island resort in the Maldives, in 2018.

"This was a big design statement and a big investment at the time," says the practice's principal architect, Yuji Yamazaki. "But, as the price of solar panels goes down, I hope that going fully solar will become a more viable option for many smaller projects, particularly in equatorial countries."

Although Kudadoo remains largely "symbolic" for now, according to Yamazaki, its renewable energy generation system may be adopted more widely in the Maldives over the longer term. The low-lying archipelago is extremely vulnerable to rising sea levels and its tourism industry is far from sustainable. In 2019, the sector accounted for 40% of the nation's total CO₂ emissions, more than three-quarters of which resulted from electricity generation.

According to the World Bank, tourism directly accounts for about a quarter of the Maldives' GDP, which contracted by an estimated 28% in 2020. In many territories that depend this heavily on income from holidaymakers, the pandemic has not offered a golden opportunity for ecosystems to recover. On the contrary, local populations have suffered, while tourism-reliant conservation schemes have foundered.

Paul Gardiner is CEO of the Mantis Collection, a company that owns 'eco-lodges' and hotels on every continent. Although it is investing in exciting projects at its ecotourism innovation hub in the South African

Commercial feature

Brands transform in the decade of action

Businesses are realising they and their supply chains need to embrace sustainability and ESG to survive – and marketing is a crucial ingredient

Covid-19 was a major inflexion point in the sustainability agenda. Consumer attention on environmental issues had been rising for some time already, fuelled by high-profile figures such as David Attenborough and Greta Thunberg. When the global pandemic arrived, it was initially feared it could set the agenda back – in reality, the opposite has been true. The global health crisis has caused people to reevaluate their life choices and place in the world, and this time for introspection has driven a large acceleration in consumer expectations around sustainability.

Businesses are facing a perfect storm of pressure: downwards from their shareholders, who want to invest only in sustainable businesses, and upwards from the growing number of consumers who make it known they will only purchase from responsible brands. Meanwhile, the pandemic has also exposed the fragility of global supply chains, causing organisations to seek to tap into more local supply chains as well as investing in more resilient, sustainable practices.

"The reality is the supply chain is where a lot of their emissions are," says Kevin Dunckley, chief sustainability and innovation officer at HH Global, the largest marketing outsourcing business globally. "There are also the social and human rights elements to consider. Are your suppliers paying a decent living wage to their staff? Do they conduct business responsibly? Why is that price so good? Do nothing and organisations could be opening themselves up to risk in several areas."

Companies are realising they are in the decade of action, and transformation is required to succeed – starting at the very core of an organisation: its business model. The traditional profit-at-all-costs model is being challenged by a need to embed,

and measure, purpose alongside that. The triple bottom line of people, planet and profits has never been more relevant, and it's increasingly evident that firms adopting this model are more profitable overall.

While brands may want to be more sustainable, however, it is difficult turning their intentions into measurable action and results. Even when they are embracing more sustainable practices, they still need to communicate that effectively to stakeholders. This makes marketing critical to sustainability because it is the touch point



The savviest brands recognise business for good is good business

with the customer. What's on the pack, shelf edge, TV ad or label is essential to how customers think of a brand, and its products and services. Equally, while companies may change their own practices, their supply chain must evolve too.

With a large, fully managed global supply chain of over 10,000 suppliers, HH Global sits in the sweet spot between the global brands it partners with and a large managed supply chain. Its industry-leading sustainability programme, Innovation with Purpose, which is based around the UN Sustainable Development Goals, is designed to support and accelerate its clients' sustainability

programmes and drive best practice and innovation through the supply chain.

"We take pride in the quality and capability within our network," says Dunckley. "We see upstream and downstream across the whole value chain, giving us unique insight into marketing campaigns, tactics and strategies. We can recommend more sustainable materials, help reduce unnecessary plastic usage, deploy new technologies and drive innovation. We are building out diverse, innovative and sustainable supply chains and helping drive spend volumes through them. A rising tide raises all ships, so we partner with our supply chain for the benefit of all."

The decade of action has already begun, and business has a crucial part to play in moving the needle in the right direction. Though governments can create policy and regulation, ultimately it is businesses and their customers that will drive the necessary change. The savviest brands are seeing that business for good is good business, and they will thrive long into the future. The brands that fail to prioritise sustainability and ESG, however, will simply not be around in the longer term.

"Their investors will divest, their customers will desert them and their businesses will become irrelevant," Dunckley adds. "This isn't a fad. This is business as usual now and the world is watching."

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