The background of the cover is a photograph showing a dense green park in the foreground, with a city skyline in the distance. The skyline includes several prominent skyscrapers, some with construction cranes. The sky is a pale, hazy blue. A vertical teal line is on the left side of the page.

# Picking up the pace

**Property and  
infrastructure carbon  
survey 2021**

NOVEMBER 2021

# EXECUTIVE SUMMARY

It has been a year like no other in the corporate fight against climate change. As our data shows, more companies than ever understand the important responsibility that they hold and, as a result, talk has turned to action.

In the second year of our carbon survey we have seen a 39% rise in companies increasing their carbon reduction efforts and a 25% increase in the number of organisations with a carbon strategy.

Uncovering a global view of how the property and infrastructure industry is tackling climate change has highlighted some major shifts in learning and discovery.

In October 2021 invited over 1,500 business leaders to respond to our annual survey, and sought additional, independent views to gauge public opinion of the construction industry.

Collaboration is critical to the industry's success in driving down its carbon emissions. No one has all the answers but if we work together to share our learning, support new technology and inspire each other, we can achieve much more. We must focus on capacity building - developing the skills that organisations and communities need to survive, adapt, and thrive in this fast-changing world.

Thank you to everyone who shared their position and experiences by taking part. We received responses from right across the world, from organisations of all sizes and across multiple sectors.

## COP26

With COP26 proceedings over, the industry is asking itself what the conference will mean for the built environment and how it might result in meaningful action.

In this report we have additionally looked at people's hopes and expectations of COP26, reviewed the key announcements and provided insight into what we think it will mean for the future of construction.

As the construction sector continues to grow, the need for both new and repurposed buildings, and improved infrastructure, continues.

According to the World Green Building Council, over the next 40 years the world is expected to build 230 billion square metres of new construction – adding the equivalent of Paris to the planet every single week. By 2060 the global building floor area is likely to have doubled.

This rapid growth will not be without consequences unless we find a way to fundamentally, and collectively, transform how, what and where we build. The critical window of opportunity to address the challenge of new and existing buildings and infrastructure is now.

## Key findings

**85%**

of organisations increased their carbon reduction effort in the last year

61% in 2020

**54%**

of organisations changed, or plan to change, their business model to respond to the climate emergency

New question in 2021

**35%**

of organisations have a carbon strategy

28% in 2020

# SURVEY FINDINGS

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**Sustainable. Egalitarian. This is the world we all want. Making it happen? That's going to take environmental, economic and social leadership – and the full force of our collective ambitions.**

We're living in a world that's developing fast. The societal need for property and infrastructure is ever-growing and the urgent need for sustainable development is ever more pressing.

The built environment holds many of the answers to a better future, but with almost 40% of carbon emissions coming from the development, construction and operation of buildings, is the industry doing enough to reduce its impact on the planet?

2021 may long be remembered as a year of economic and social challenge but, despite the adversity, it may also be heralded as the year that the tide began to turn on carbon emissions.

# INDUSTRY OPINION

## 2021 – the strongest year yet

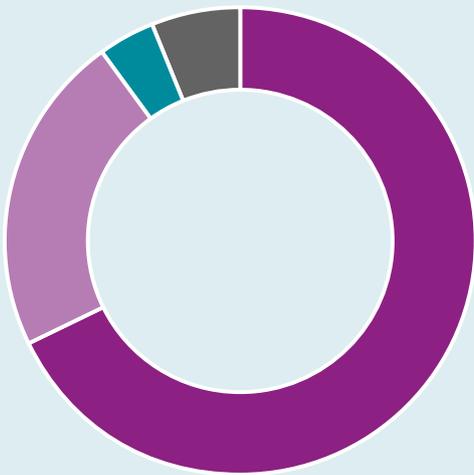
As a carbon intensive industry, those responsible for the built environment cannot sit back and wait for solutions. The sector must work together to step up its efforts.

In 2021, according to 68% of business leaders across the globe, it did just that – making more progress in carbon reduction than in previous years.

Talk began to turn to action right across the world, with ambitious targets transforming into bold action and increased application of emerging new technologies. However, at this crucial tipping point, it is acknowledged that far more still needs to be done.

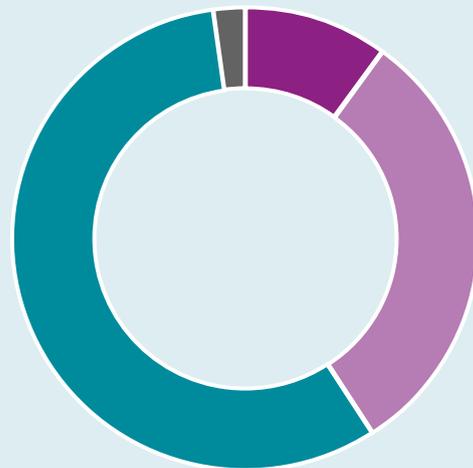
Until recently the industry has been slow to adopt transformative change and 57% (86% in North America) reported that those responsible for the development, construction and operation of buildings and infrastructure still need to do far more to cut carbon emissions.

In your view, how much progress in carbon reduction has the property and construction industry made in 2021?



- More than previous years **68%**
- About the same **20%**
- Less than previous years **4%**
- Not sure I can answer this **6%**

In your view, are those responsible for the development, construction and operation of buildings and infrastructure doing enough to cut carbon emissions?



- Yes, the construction industry is moving ahead of others **10%**
- It's doing as much as it can for now **31%**
- No, far more needs to be done **57%**
- Not sure I can answer this **2%**

## Uncovering the true value of carbon reduction

Being able to quantify the value of low carbon solutions and the additional benefits they can offer is often the first step towards businesses amplifying their efforts.

Fifty-one percent of the respondents said that they have quantified the value of their carbon reduction initiatives, while 29% are still trying to work out how to identify and record any savings - rising to 40% when looking at businesses with less than 5,000 employees.

For the companies able to measure their carbon reduction successes, 18% said they have benefitted from lower business operating costs, while 13% have seen additional sales, 10% have recorded an improvement in recruitment and/or retention, and 4% have achieved a lower cost of finance and insurances.

**51%**

**of respondents have quantified the value of their carbon reduction initiatives.**

“

**The industry is crying out for new tech solutions and delivery expertise. We have a responsibility to partner with companies to give them the support they need to test and improve their products and get them to market faster. We all need to invest in research and development as well as support smaller businesses who find it difficult to access opportunities, share their ideas and influence change.**

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**Isabel McAllister**  
Responsible Business  
Director at Mace

# CARBON COMMITMENT

## Effort reaches new highs

In a year where the vulnerability of societies around the world became more apparent than ever, it is perhaps no surprise that 85% of organisations increased their carbon reduction efforts.

Looking at comparative data from 2020 and 2021, there has been a significant shift in companies progressing their Scopes 1, 2 and 3 targets, as well as earlier implementation of plans to become carbon positive.

Our findings showed a 23% increase in businesses setting their Scope 1, 2 and 3 targets for 2025, a 5% increase in businesses aiming for 2030 and a 12% decrease in businesses focusing on 2040.

Findings were similar for businesses committing to Science-based targets with 36% aiming for 2025 (a three-fold increase on last year).

The biggest challenges that businesses reported were a lack of, and commercial viability of, low carbon technology (26%), with 18% stating that there is insufficient low carbon technical/commercial delivery expertise available.

## CHALLENGE

### Cost of concrete and steel alternatives

Joined up approach with landlords

#### Client motivation

Supply chain engagement

### Decarbonisation of fleet

Purchasing composite materials from overseas

### Reducing embodied carbon

## ACTION

### Use recycled steel and aluminium

Switch to renewable energy

#### Employ specialists

### Reduce diesel use

Work with the supply chain

#### Reduce travel

### Procure locally sourced materials

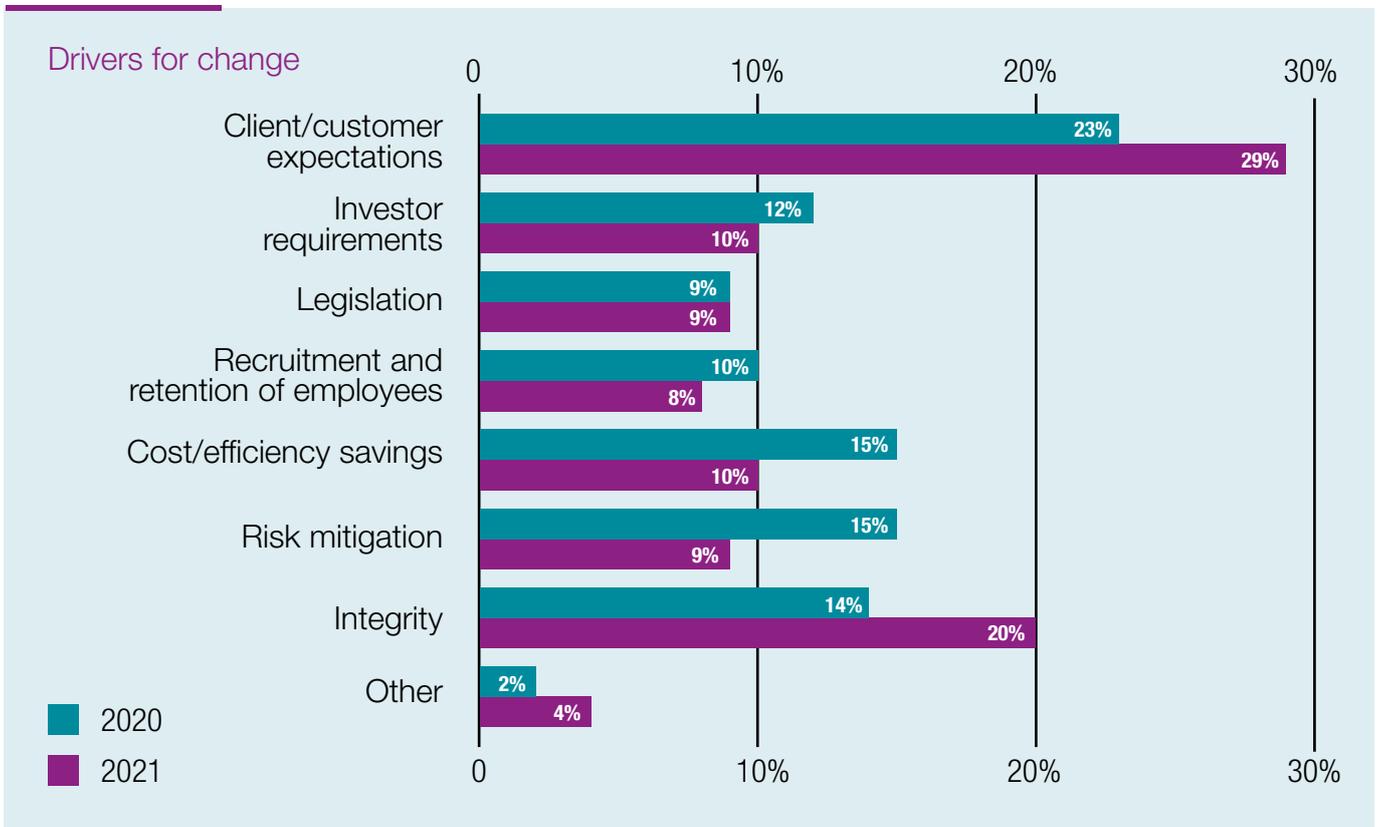
Increase use of data

## Clients are still in the driving seat

As the pressure to take action to address climate change continued to mount in 2021, for the second year clients were the key motivator.

Almost 30% of people said clients were a driver for increasing their efforts – a 26% increase on 2020. Integrity for companies to ‘do the right thing’, rose by 43% year-on-year while cost efficiencies and risk mitigation dropped by 50% and 40% respectively.

**29%**  
**of respondents are motivated by clients' needs**  
 23% in 2020



Sustainability has long been celebrated as a major hook for recruitment ambitions, with reports suggesting that 65% of people want to work for an organisation with a strong social conscience.

Interestingly, just 8% of respondents said they recognise the impact that acting sustainably can have on the recruitment and retention of employees – down 20% year-on-year.

To understand whether sustainability is a driver for recruitment, we additionally looked at how it

affects people’s decision to join a company. It should be noted that the people we surveyed were limited to senior decision makers and therefore not reflective of the entire workforce.

Our findings showed that 21% would only work for a business that is committed to operating sustainably. Forty-nine percent said it is of interest but not essential, and for 26% their interest in working for a business would not be affected by its sustainability efforts at all.

## Businesses are about to look very different

Climate change is forcing businesses to consider making fundamental changes for the future – to operate effectively in different climates but also to continue to compete in rapidly changing markets and continue to attract the best talent.

Our findings highlight that 45% of businesses have already changed their business model to better respond to the climate emergency, with a further 15% about to join them. The majority are offering, or plan to offer, new low carbon products and divest from fossil fuels, while others are investing in clean technology and green energy.

Delving deeper, we looked at those yet to embark on business model changes and discovered that in the next five years over half of companies intend to adapt the way they operate to respond to the climate emergency, with 7% completely changing their business model.

# 45%

**of companies have changed their business model to respond to the climate emergency.**

Fundamentally changing how a business is run and, possibly, even what its core purpose is, shows a phenomenal shift in organisations recognising the true value of acting responsibly.

Does your business have a five year plan for addressing the climate emergency?



**Yes**, my business will need to **completely change** its current business model

**Yes**, my business will need to make **significant changes** to its current business model

**Yes**, my business will need to make **small changes** to its current business model

# CARBON MANAGEMENT

## Greenwashing won't wash

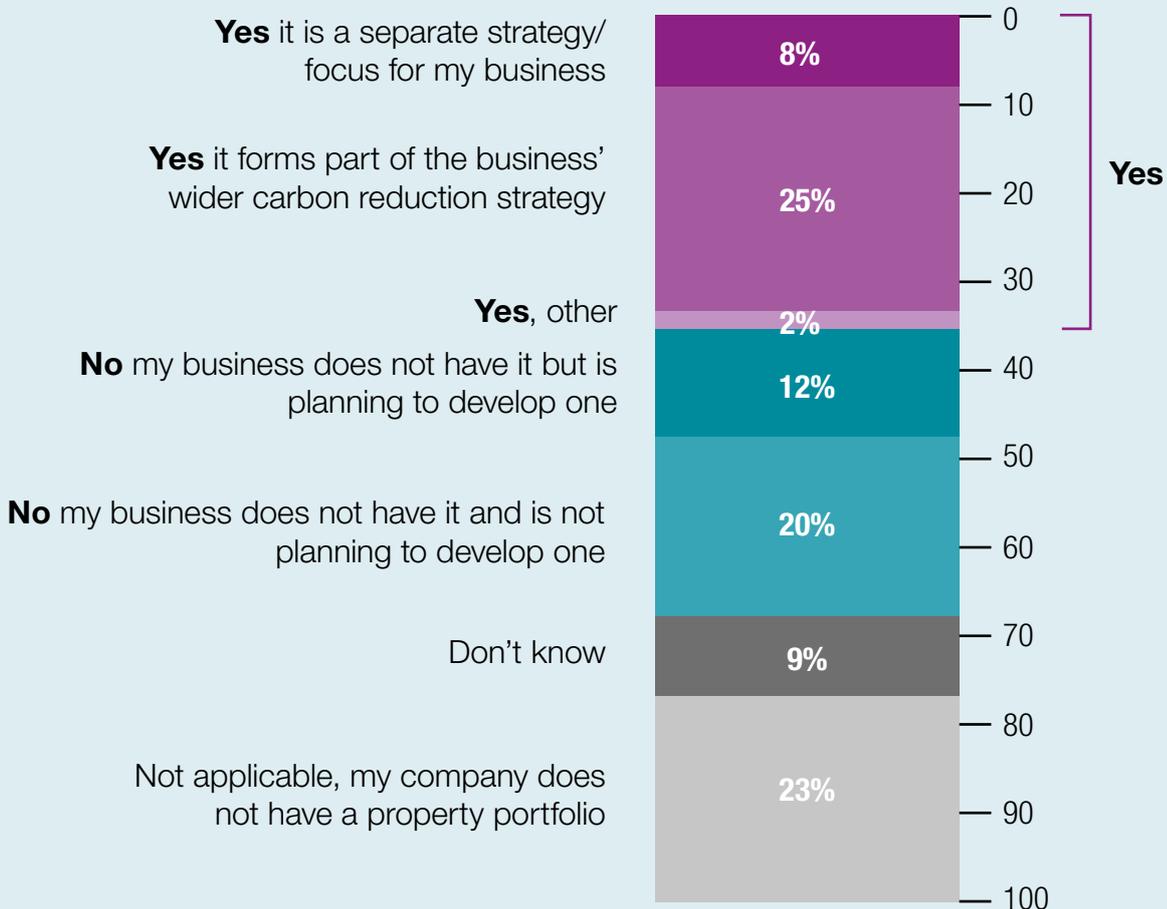
Greenwashing received a lot of attention at COP26 with climate activists demanding that world leaders 'stop giving a false impression of their environmental actions', and the International Monetary Fund calling on regulators to prevent financial companies from making misleading claims concerning their environmental credentials.

For businesses that are serious about sustainability, the answer lies in robust strategies that guide their business operations and decisions from every angle.

As talk turns to action, over half of businesses now have a carbon reduction strategy for their property/infrastructure portfolio and for the majority it forms part of their overarching business strategy.

Geographically, businesses in Europe appear to be leading the way in terms of formally documenting their ambitions and efforts, with 81% stating that they have a carbon reduction strategy for their property and/or infrastructure portfolio. In the Americas, 50% of businesses said that they have a strategy in place, while none of the companies head quartered in Asia Pacific reported formalising their plans yet.

Does your business have a carbon reduction strategy?



## Getting on the front foot

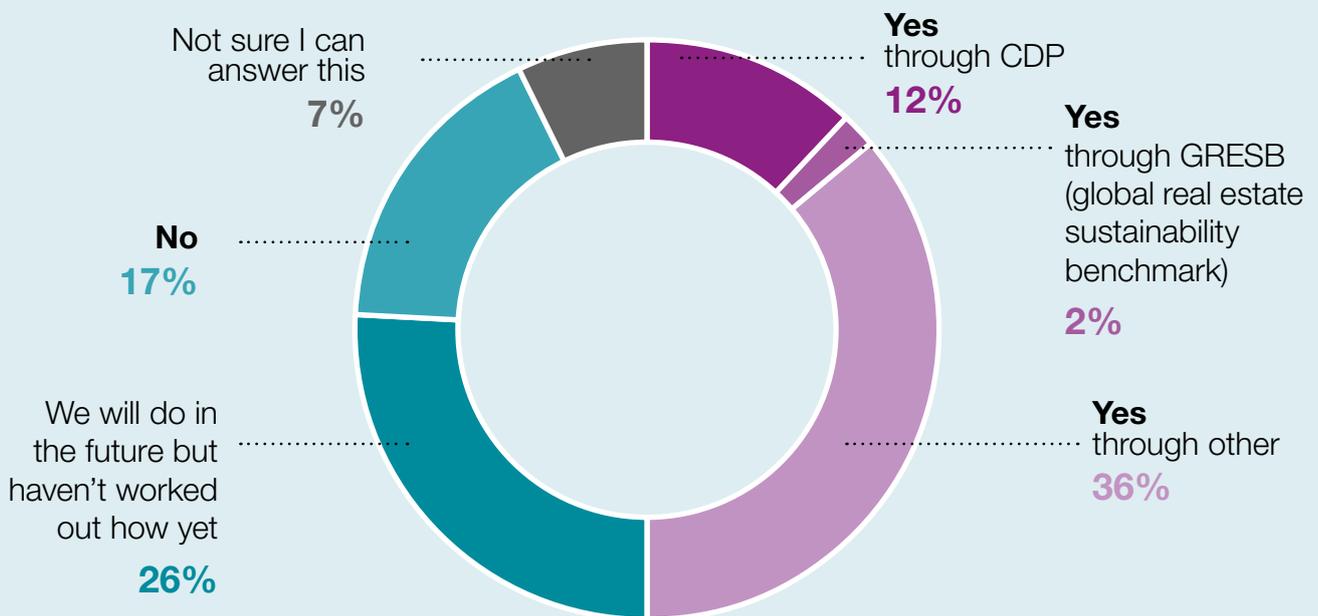
It can naturally be assumed that a rise in sustainability strategies will generate a rise in transparent reporting.

Stakeholder and investor interest, as well as customer and client expectations drives businesses to be more transparent about their actions and results. And with data capture becoming easier to adopt and conversations growing around environmental, social, governance (ESG) reporting, many businesses are looking to get on the front foot before formal regulation is introduced.

Reporting is becoming more common place, but there is still some way to go with half (50%) of businesses stating that they report their carbon position externally.

The remaining challenge for many is how they capture data accurately, with 26% reporting that they intend to publish their position in the future but haven't yet worked out how.

Does your organisation report its carbon emissions externally?



# COLLABORATION

## A major step change

The overarching consensus (64%) is that the property and construction industry is, in part, working together to find carbon reduction solutions. However, with 10% feeling that action is still happening behind closed doors, some businesses are clearly being left behind.

Despite this, a phenomenal 97% of businesses said they are supporting the carbon reduction agenda beyond their own organisation.

For 28%, they are supporting clients with their ambitions – a 180% increase since 2020. This was even higher amongst companies head quartered in the Americas (50%).

All other responses indicated a drop in the last year, particularly ‘informing regulation/policy’ which was a focus for just 11% of companies (58% less than in 2020) and perhaps an indication of talk turning to action that has moved above and beyond regulation.

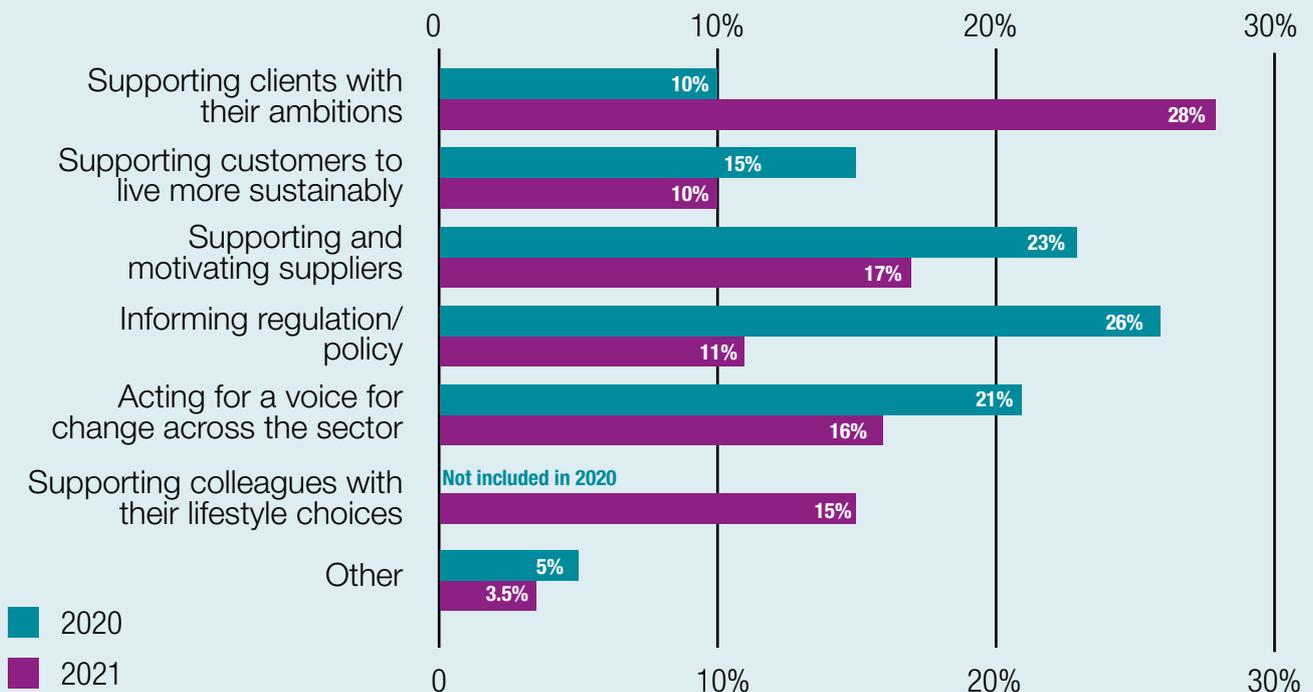
Responses from companies with more than 5,000 employees demonstrated a far higher commitment to supporting and motivating suppliers (29%) and supporting customers to live more sustainably (36%).

# 28%

**of businesses are supporting clients with their ambitions**

**10% in 2020**

How are you supporting the carbon reduction agenda beyond your organisation?



# SHARED INSIGHT

It is critical that as we all navigate the ever-developing world of carbon reduction and climate change resilience, we take others on the journey with us – sharing our learning and inspiration – so that the industry progresses as a whole.

Thank you to everyone who shared their initiatives, lessons and discoveries from the last year.

## Initiatives and investments

- Establishing a multi-disciplinary team to drive our carbon reduction strategy. It was surprising how many people wanted to be involved so it's now led by people from across the business and is no longer seen as a corporate responsibility.
- Changed all of our lights to LED and moved to green electricity.
- Reducing the number of physical site visits we make. Covid taught us that the technology exists for us to work in new ways and virtual visits can be just as effective.
- Investment in electric hot melt mixers instead of gas/oil fired.
- Developed a new product that enables glued post-use flooring to be recycled. We expect to recycle 8,500 tonnes or 3 million sqm of flooring by 2025, with a view to continue expanding.
- We rolled out a number of trials to attempt to find ways to improve emissions across our transport fleet. We have changed our company car policy to encourage colleagues to take more hybrid and electric cars, and we have introduced a number of diesel hybrid trucks to our commercial fleet.
- Introduced green energy and smart building energy monitoring systems.



LED lighting



Electric hot melt mixers instead of gas/oil fired



Green energy

## Lessons learned

- Investment costs money up front but there are long-term savings to be made.
- Two schools built to the same design by the same contractor but with different operating Trusts can have a variance of 30% in CO<sub>2</sub> operational use.
- Technological changes are easier to implement than people's habits. We must invest as much in training operatives to use new technology as in purchasing the equipment.
- Learning about and understanding the process of steel production in our supply chain has allowed us to have better informed conversations with our clients, and explore alternatives within our designs. This is largely around EAF/BOF capabilities and the carbon associated with the different steel making methods. Passing this information both up and down our supply chain has been invaluable in collaborating to produce alternatives for lower carbon structures.
- Just how much we can help by collaboratively working with clients and supply chain – it's a win win for all.
- Green energy options and the ease of moving to renewable energy.

## Discoveries

- Thames River can provide approximately 3MW as an energy source per mile stretch. This is being integrated into our design plans as a renewable source, moving away from fossil fuels such as gas.
- With the use of hydrogen fuel cells we might be able to decarbonise our fleet in the near future.
- Carbon eating exterior paint for buildings.
- Free heat sourcing from ground assets to heat third party buildings.
- Utilising heat exhaust rejection from the TFL exhaust shaft located within our site boundary.
- Trialling the use of HVO D+ Biofuel and Flybrid cubes to reduce the use of diesel-powered equipment.



Electric vehicle charging point

# COP26 INSIGHT

**Between 31st October and 12 November, the world turned its attention to the UN's annual COP26 climate conference.**



Having missed a year due to the global pandemic, and riding on the wave of 2020 being the hottest year on record, the tone felt different to past COP events.

The message was stronger, the presence was greater, and the activists and impacted communities were louder.

But will it result in meaningful action, and how will the property and infrastructure industry react?

We look at people's hopes and expectations of COP26, review the key announcements and provide insight into what we think it will mean for the future of construction.

## The run up to COP26

No country, business or individual holds all the answers to climate change. While some are more advanced than others, there is very real need for one collective pact and supporting guidance. That is why the UN climate change conference is so important.

In the weeks before COP26, as talk turned to predictions, we asked business leaders what their hopes and expectations were.

## What do you hope will emerge from COP26?

**Incentives to achieve NZC**      **New carbon targets**

**Increased funding**

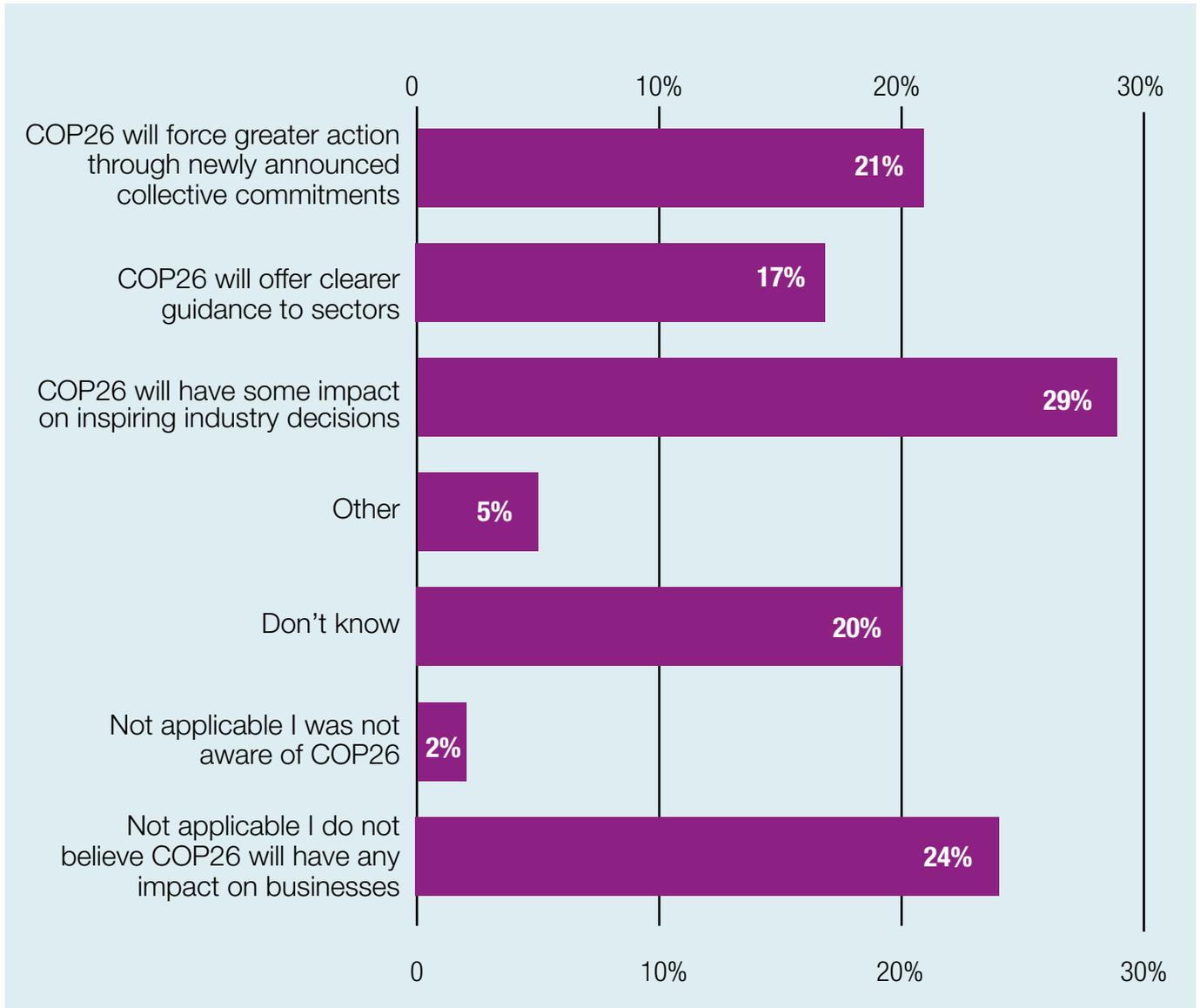
# Global carbon reduction agreement

**New regulations**      **Practical solutions**

**Pledge to fossil fuels**      **Clear action plan**



### What impact do you expect COP26 will have?



Almost

**70%**

of respondents said that they expect COP26 to have an impact, either by forcing action, offering clearer guidance or inspiring discussions

versus...

**24%**

of respondents who said that they do not believe that COP26 will have any impact on businesses.

# COP 26 INSIGHT

## COP26 round up

The culmination of twelve days of speeches, presentations and fierce negotiation was a new global agreement which was announced on 13 November. Although not legally binding, it has set the global agenda on climate change with a number of key commitments, some of which will impact the built environment:

### Funding

World leaders pledged to increase the funding available (an estimated \$96bn a year by 2022) to help countries-in-need manage the effects of climate change and switch to clean energy. However, some countries didn't feel it was enough.

### Emissions

While an agreement on cuts to carbon emissions wasn't reached, it was decided that countries will meet next year to pledge further cuts to try to keep temperature rises within 1.5C. Current pledges will only limit global warming to about 2.4C.

### Fossil fuels

Coal use currently generates 40% of annual CO<sub>2</sub> emissions. An agreement was reached to reduce countries' reliance on it (importantly this included commitments from major coal-users such as Poland, Vietnam and Chile), however it made headlines for a last minute softening of the language - forced by China and India - which resulted in a change from 'phase out' to 'phase down'. Regardless, this was the first COP agreement to limit the use of coal.

### Nature and land

Over 100 countries (accounting for 85% of the world's forests) agreed to stop deforestation by 2030. Forty-five governments pledged urgent action and investment to protect nature and shift to more sustainable ways of farming, and 95 high-profile companies committed to being 'Nature Positive' - agreeing to work towards halting and reversing the decline of nature by 2030.

“

**Is this how our story is due to end – a tale of the smartest species doomed by that all-too-human characteristic of failing to see the bigger picture in pursuit of short-term goals?**

**Sir David Attenborough**  
Naturalist and broadcaster.

”

“

**The clock is ticking to the furious rhythm of hundreds of billions of pistons and furnaces and engines with which we are pumping carbon into the air faster and faster ... and quilting the Earth in an invisible and suffocating blanket of CO<sub>2</sub> raising the temperature of the planet with a speed and abruptness that is entirely man-made.**

**Boris Johnson**  
Prime Minister

”

“

**Our addiction to fossil fuels is pushing humanity to the brink. We face a stark choice: either we stop it or it stops us. It's time to say 'enough'.**

**Antonio Guterres**  
U.N. Secretary-General

”

In other announcements, the US and China (the world's biggest CO<sub>2</sub> emitters) pledged to dial up the switch to clean energy generation in the next decade; more than 100 countries promised to cut methane emissions by 30% by 2030 (although the biggest emitters - China, Russia and India didn't sign up); and financial organisations responsible for assets worth \$130tn agreed to back 'clean' technology and direct finance away from fossil fuel-burning industries.

“

**It has sometimes been observed that what leaders do for their people today is government and politics. But what they do for the people of tomorrow – that is statesmanship.**

**Her Majesty The Queen**

”

“

**We say no more blah blah blah, no more exploitation of people and nature and the planet. No more whatever the f\*\*\* they are doing inside there.**

**Greta Thunberg**  
Environmental activist

”

“

**There's no more time to hang back or sit on the fence or argue amongst ourselves. This is a challenge of our collective lifetimes. The existential threat to human existence as we know it, and every day we delay, the cost of inaction increases.**

**Joe Biden**  
US President

”

“

**Are we so blinded and hardened that we can no longer appreciate the cries of humanity... can there be peace and prosperity if two thirds of the world live under siege and face calamitous threats ...if we don't [act in the interests of all people dependent on us] we will allow the path of greed and selfishness to sow the seeds of our common destruction.**

**Mia Mottley**  
Prime Minister of Barbados

”

“

**We are already gasping for survival. Tomorrow is not an option, for it will be too late.**

**Wavel John Charles Ramkalawan**  
Seychelles President

”

## What could it mean for the building and infrastructure industry?

The 26th conference of COP was the first time that the UN's annual climate conference specifically addressed carbon emissions from buildings.

Cities, Regions and Built Environment Day gave our industry a seat at the table, encouraging new solutions to be shared and providing a platform for bold commitments to be announced.

Nature and Land Use Day also provided an opportunity to discover some of the latest solutions to global greenhouse emissions and demonstrate regeneration projects that are helping communities to combat the devastating effects of climate change.

The next few months will prove interesting as industry bodies and leaders digest the Climate Pact and rethink their targets and approach to transformation. However, a few key announcements have already been made that we need to take note of:

### Net Zero Carbon Buildings Commitment

The World Green Building Council announced a further 44 businesses had signed up to the Net Zero Carbon Buildings Commitment, taking sector-leading action on whole life carbon emissions.

Each business has pledged to decarbonise the built environment across their portfolios and business activities by 2030 by; reducing operational emissions of new and existing built assets; only owning, occupying and developing buildings that operate at net zero carbon; achieving maximum embodied carbon reductions for new developments and major renovations over which they have direct control; compensating for residual operational and upfront embodied emissions that cannot be mitigated; and advocating for wider emission reductions via their business activities and reporting on their impact.

### Whole Life Carbon Roadmap

Meanwhile in the UK the Green Building Council (UKGBC) unveiled its [Whole Life Carbon Roadmap](#) - a tool to help built environment businesses measure and cut carbon from materials, processes, operation and demolition.

The Roadmap plots a pathway to net-zero by 2050 for the UK's entire built environment sector, in which there is a sharp decrease in operational and embodied carbon through to 2035 and a more gradual decrease between 2035 and 2050. It includes action plans for 14 of the built environment industry's key stakeholders, plus a separate, specific summary for policymakers.

A further nine European Green Building Councils are expected to announce their roadmaps in the coming months.

### **Stronger commitments are needed**

Despite the decarbonisation of buildings and infrastructure being of critical importance, they are notably absent from many NDCs (Nationally Determined Contributions – a country’s climate action plan to cut emissions and adapt to climate impacts). Of the 186 countries that submitted NDCs, just 136 mention buildings, with only 53 talking about building efficiency and 38 addressing building energy codes.

Many countries will need to quickly develop more detailed plans to address the built environment with decarbonisation targets and new building performance standards.

### **The greenest building is the one that already exists**

While the design and delivery of new buildings are critically important in achieving net zero, retrofitting and regenerating existing buildings is the key. This is especially true in heavily developed countries, where the majority of buildings that will exist in 2050 have already been built.

Because most buildings in developed countries were constructed before building codes were introduced, the International Energy Agency (IEA) recommends that building retrofits increase from 1% to an average of 2% per year by 2025, and 3% annually by 2040. The Agency also recommends that the industry focuses on more deep retrofits that reduce a building’s energy consumption by 30–50%.

### **Embodied carbon must be addressed**

It can take up to 80 years for a new, energy-efficient, building to overcome the climate impacts created by its construction. We must turn our attention to addressing embodied carbon in our industry, namely the emissions associated with materials, including those created during the manufacturing process and transportation to site, and the construction practices we use.

Throughout the industry we must all be careful that discussion on a global scale does not intimidate local action – nor must we devolve responsibility by focusing on countries or industries that refuse to acknowledge the part that they need to play.

Responsibility sits with us all. Regardless of the influence that an individual or a business has, the important message here is that every action, however small, is a step in the right direction. The race against climate change won’t be won by giant isolated leaps, it will need small steps in herds. We all have personal and professional spheres of control and influence - putting our time and energy into these is the best thing we can all do to help fight climate change.

### **Natural infrastructure has to be a priority**

Firm commitments are needed to radically increase investments in nature-based solutions and biodiversity programmes, particularly in and around cities.

In less developed countries that routinely experience the impact of climate change, replacing traditional concrete-heavy infrastructure with green alternatives, is proving to be a viable, cost effective solution.

A recent study by The International Institute for Sustainable Development (IISD) that looked at the benefits of replacing newly-built or engineered infrastructure with nature-based alternatives found a 50% cost saving.

And with the U.N. reporting that \$4.3 trillion worth of global infrastructure is needed, if 10% could be fulfilled as green projects there would be a saving of \$248 billion per year.

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# RESPONSIBLE BUSINESS CONSULTANCY SERVICE

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## Fighting climate change. Protecting biodiversity. Responding to growing populations.

We support our clients to deliver property and infrastructure projects with positive change - to understand and challenge sustainability and social value ambitions, embed innovative solutions and deliver industry-leading transformation that tackles social inequalities and reduces climate impacts.

Since 2012, Mace has been driving sustainability efforts through the industry; working with businesses of every scale, in every sector and across hundreds of locations to adopt best-practice solutions and make change happen.

From carbon reduction programmes, sustainability strategies and green building certifications, to social value delivery frameworks, behaviour change programmes and ESG reporting; our specialist team blend strategic advice, sector knowledge and proven delivery methods to redefine ambitions and provide certainty of commercial and social viability.

We work with clients at every stage of the sustainability journey, from scoping opportunities and setting targets, to developing strategies and exploring investment opportunities. As we all strive to do the right thing, joining forces is key.

If you want to have a chat about anything related to the work we are doing around the world and how we can support your business in achieving ambitious sustainability goals, please contact us.



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