Corporate Sustainability Lessons Learnt

Acting on carbon:
The building blocks for Net Zero
Our 15 year journey

PwC in the UK
February 2024

pwc

Introduction

The effects of climate change on our planet are already being felt acutely across the globe, creating one of the largest challenges for society, business and nature. Hurricanes and wildfires are devastating communities, coastlines are threatened by storm surges and sea level rise, water availability is changing, and vast areas of land are becoming infertile. The social and economic consequences of these changes are widespread, with the poorest people who are least equipped to cope often affected the most.

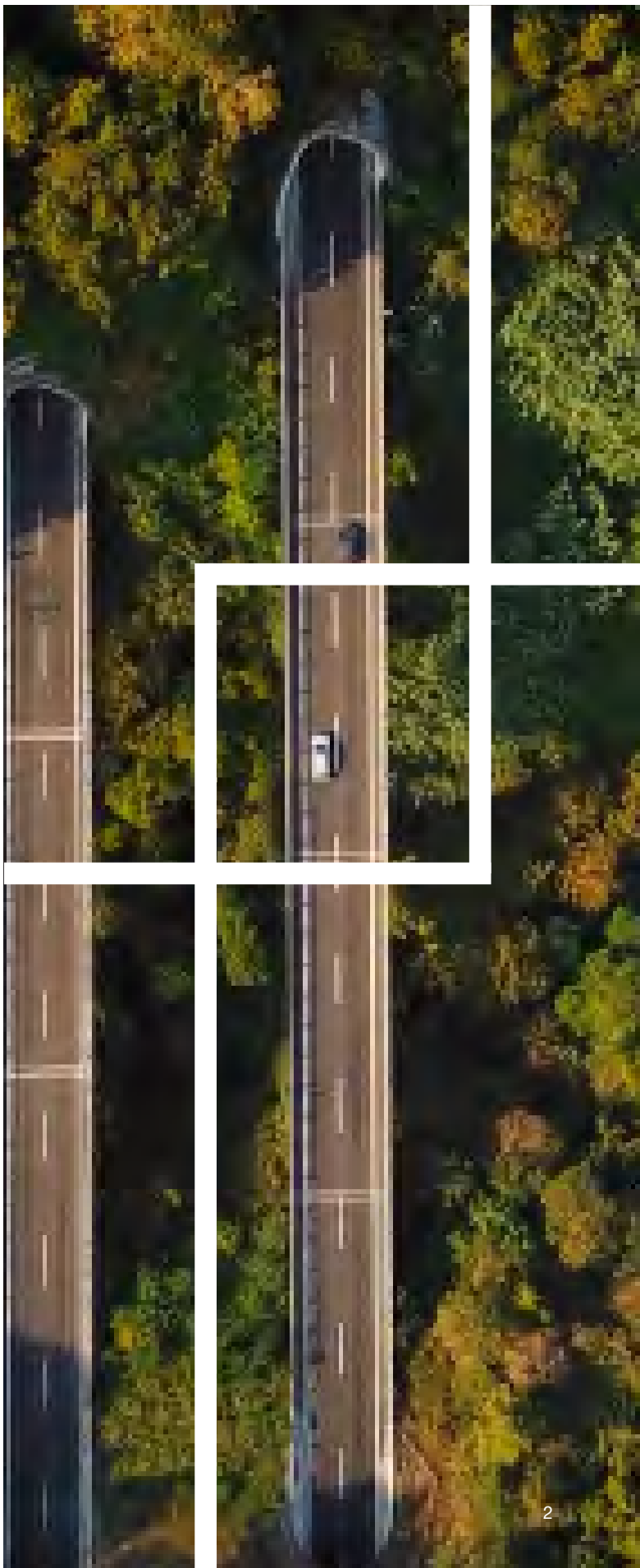
The carbon emissions from our business operations contribute to global warming and therefore the changes in climate. Although our carbon footprint is small compared to many industries, it's still our largest environmental impact - so we're committed to doing what we can to minimise it, as part of being a responsible business.

Our purpose is to build trust in society and solve important problems. We understand how important it is to be part of the solution and drive change across our own operations, throughout our supply chain and for our clients. This all starts with getting a clear and accurate picture of our carbon footprint to help us understand where we should focus our reduction efforts.

Our Lessons Learnt publications are designed to share our experience of implementing our sustainability strategy, in order to allow others to learn from our successes – and our mistakes. Tackling the climate and nature crisis is core to our purpose. We set our first carbon emissions targets back in 2007, and have since refreshed our strategy several times, most recently in 2023 to focus on delivering our Net Zero goals. As a result this document summarises our 15 year journey to 2022, with subsequent Net Zero performance found within our Annual Report [1].

Between 2007 and 2022 we reduced the greenhouse gases associated with our scope 1 and 2 emissions by 98% in absolute terms. Moreover, we've reduced our overall carbon footprint, including emissions associated with our travel, waste and materials, by 83% - whilst growing our business by the same amount - evidencing the decoupling of our business growth from our environmental impacts. This report tells the story of how we've achieved this.

Further information on our environmental initiatives can be found at www.pwc.co.uk/corporatesustainability and details of our contribution to all of the Sustainable Development Goals '(SDGs)' is available to view at www.pwc.co.uk/sdg.



1. Performance figures relate to the time of publication. As greenhouse gas reporting is an emerging field, with frequent changes to scope, reporting standards, as well as methodological updates, these may not mirror our latest reported figure.

Executive Summary

The impacts of climate change are increasingly being felt across the globe, from extreme weather to changes in land fertility, with widespread social consequences. At PwC we're committed to playing our part in addressing our own carbon emissions – our stakeholders expect it of us and it makes economic sense for us, too.

By reimagining how we run and occupy our offices, we've cut the carbon footprint associated with our buildings' energy consumption by 81%, saving us over £40 million in cumulative energy costs since 2007. We've also focused on programmes to reduce the negative impacts of our business travel and waste, alongside engaging our people, stakeholders and clients. Collectively these have enabled us to reduce our total absolute 2022 carbon emissions by 83% compared to 2007 (exceeding our 40% target), whilst doubling the size of the business.

We began our fifteen-year journey by focusing on carbon emissions from our buildings, as these were the emissions we had most control over and ability to influence. This was in line with the market expectations at the time and these formed the majority of our carbon footprint, prior to the use of renewable energy. We adopted four complementary approaches: operating differently, consolidating our office space into fewer properties; refreshing our real estate to adopt sustainable designs; and investing in new technology.

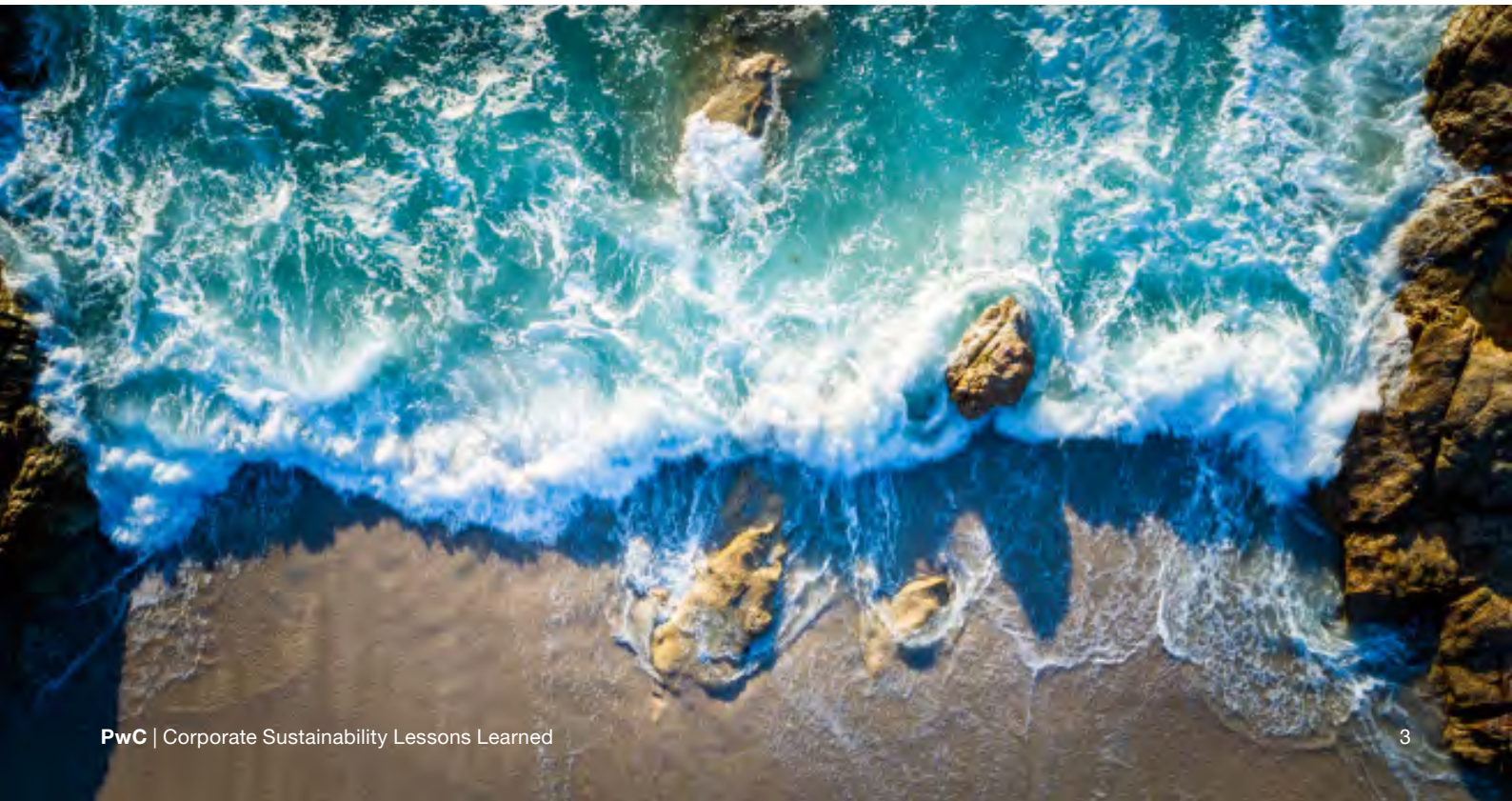
As the climate change agenda evolved, companies were increasingly expected to understand, quantify, and take responsibility for all of their carbon emissions – not just those associated with their energy consumption. For us, the largest of these new emission sources was our business travel, which now forms a large proportion of our greenhouse gas emissions.

More recently, with the emergence of the Net Zero agenda, businesses are further expected to take account of their indirect scope 3 carbon emissions, including those associated with the goods and services we procure - which has led to the development of our comprehensive supply chain sustainability programme. Further, the rise of hybrid working has not only transformed the way we utilise our buildings, but also shines a spotlight on emissions not previously considered by many businesses; those attributed to our employees commuting and working from home. Despite these also being outside of our operational control, growing expectations have led us to developing a number of engagement initiatives for our people, supporting them to minimise their impact regardless of where they work.

This document sets out our journey up to the achievement of our 2022 targets. We begin below by summarising the lessons we have learnt over the past 15 years, followed by an in depth review of our journey. We then share detailed information about the approaches we've used, the initiatives we've tried and - as far as is possible - the benefits each has delivered. Finally, we summarise our achievements and where this is taking us next.

We hope that the document offers practical tips and hints that will be useful for other organisations and help to accelerate the transition to a low-carbon economy.

We're proud of our achievements over the last fifteen years and, as we look forward to the next phase of our carbon journey, we believe we can do more. In 2020, PwC globally committed to Net Zero, setting verified near-term science based targets to 2030, of which we report our progress against in our Annual Report. We will be closely monitoring this alongside the evolution of our Net Zero and wider sustainability strategy.



Lessons Learnt

Table 1

Take your leadership on the journey with you	Managing carbon emissions is a complex topic. Getting your leaders on board early with your approach will give them time to understand the issues, provide guidance and support, and make it easier to secure any necessary funding when you need it.
Make reporting a priority	Decision making and tracking progress relies on access to timely, accurate and robust data. Invest in your reporting processes and document them to ensure business continuity. Utilise open source tools and sustainability software to automate processes such as emissions calculations, to reduce reliance on internal or external expertise.
Use targets to mobilise action	Targets are a powerful way to energise your business to act on carbon. Your aim should, of course, be to set Net Zero goals based on carbon science. Using interim targets as steps along the way allows you to build confidence in what's feasible.
Measure only what you need now, with an eye on the future	You don't need sophisticated measures to get going. Establish what data you can get hold of quickly to get started, then gradually increase the breadth and sophistication of data you collect as your needs and capabilities evolve. That way, you don't get bogged down in unnecessary detail, and can phase the costs of measurement so they can be absorbed into 'business-as-usual' budgets more easily.
Adopt a 'do-learn-do' attitude	Establish processes for trialling and evaluating approaches before rollout in order to identify suitability and actual performance versus claimed benefits.
Re-evaluate technology options regularly	Consider technology tools and capabilities to drive efficiency and effective decision making. Make sure you're relying on up-to-date information. Not only do new technologies appear all the time, but the cost, payback and environmental impacts of solutions change frequently. You may find that technologies that you've previously rejected are now entirely suitable.
Look outside for support	There's a lot to consider when managing your carbon footprint. Don't be afraid to get support from specialist third parties for the areas you feel less confident in, be it calculating carbon emissions, meeting regulatory requirements or evaluating suitable technology.
Set common goals with partners	Many changes will require collaboration with third parties, especially suppliers and landlords. Try to agree to common goals upfront and determine measures of success. Consider sharing the financial benefits from your initiatives to incentivise and motivate your partners.
Stay connected internally	There's no point investing in a building's sustainability features, only to find you're moving out of the office within the year, or encouraging your people to change their travel behaviours when they're about to be relocated. Work out where your interdependencies are and keep in touch across your different teams (facilities, real estate, travel, IT, communications, sustainability, etc.) so that your successes last.
Expect behaviour change to take time	In some cases, you might be able to shift behaviours overnight – for instance, if a new environment forces people to adjust their habits, like moving offices. But in most cases, it's a slow and time-consuming process and can be disruptive to your people. Do what you can centrally first, and only embark on behaviour change campaigns where there are no other ways to achieve the impact you desire.
Celebrate your achievements	Be proud of what you achieve and share it with your people and other stakeholders. It helps to engage your people and earns you the right to encourage them to take action. It can also help you to gain support from your leaders and build your reputation as a responsible business.

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A framework for our journey

Setting up for success

Embarking on a journey to reduce carbon emissions can be fairly daunting as it's a very dynamic agenda which requires regular re-evaluation of priorities and solutions to be effective. Over our fifteen year journey, new technologies were continuously being developed and payback periods were changing. Carbon science was evolving, revealing new emissions sources or revised conversion factors. Government support and regulation was still maturing and altering the financial implications of carbon management programmes, whilst stakeholder expectations were increasing alongside a proliferation of disclosure requirements.

To help manage this uncertainty, we agreed on a set of principles for how we would operate, and took a series of actions which provided us with the right structures to be able to reduce our carbon emissions effectively, as described below.

Our guiding principles in our approach to reducing carbon emissions

Minimise disruption to our people.

We've found that many changes can be made with little to no impact on our people - for instance, changing technology in our buildings in the evenings or weekends so that we don't have to close our offices. Where the change affected our people or needed them to behave differently - for instance moving offices or removing desk side bins - we communicated early so they had time to adjust and respond if necessary. This approach has made it easier to get internal buy-in for our actions.

Adopt a data-driven approach.

This has not only helped us to track our progress in reducing our carbon footprint, but also to refine and strengthen the business case for our various investments, over time.

Leverage our real estate refurbishment programme to adopt new technologies.

Although this was not always possible, timing the introduction of new technologies to our building renewals has generally helped us to adopt better technology at a lower cost and with greater engagement from our people.

Pilot new technologies in one office.

This has been particularly important where we've pioneered emerging technology. It's allowed us to 'give it a go' for technologies that would ordinarily be discounted as too risky or where the business case wasn't as clear as it might be. Trialling the options has allowed us to validate their feasibility and financial returns, improving their success rate once introduced across our whole portfolio.

Use third parties for inspiration and support.

We haven't been afraid to lean on external experts to help us identify and implement new approaches and technologies for reducing our carbon emissions. There's a lot of information in the marketplace and you can save time and money getting targeted support. The same would typically be true for policy and regulatory advice, too, although we're uniquely placed by having deep expertise on these areas in-house which we can draw on.

Engaging leadership and our people

We engaged our leadership early on in our carbon journey, educating them on climate science and the opportunities and risks around carbon management. By doing so, we've gained support for setting ambitious targets as well as approval of an ongoing, additional, annual budget to invest in a wide range of carbon reduction initiatives and technologies.

We've also invested in dedicated resources to focus on our carbon emissions, including a full time sustainability reporting team, a supply chain sustainability team, which focuses on the implementation of several supply chain engagement and monitoring programmes, an energy manager, who brings initiatives together across offices, and a behaviours team focused on helping to inform and engage our people about sustainability, specifically reducing energy, both at work and at home.

Setting targets

We gave a great deal of thought to setting our targets. They not only motivated us and guided our actions, but also formed the basis for our discussions with leadership and our communication with wider stakeholders.

We wanted our targets to be a stretch, whilst still being feasible. We also wanted them to demonstrate our commitment to national and global goals for carbon reduction. And, we've increased the level of ambition along the way, as our confidence in finding solutions has grown (see **'Deep Dive: Setting our carbon targets'** inset for more details).

Achieving external standards and awards

We sought to get accreditation with relevant external standards and applied for selected awards. These have helped us to continuously improve our systems, have provided benchmarks of our performance against other companies, and have given us a platform from which we've been able to showcase our successes to our people, our clients and other stakeholders. Indeed, we've had extensive interest in our green buildings and carbon reduction achievement from clients, policy makers and international delegations alike.

The main carbon-related standards - which we obtained for all of our offices - are ISO 14001 (since 2008) and, subsequently, ISO 50001 (since 2012), both of which have encouraged us to improve our processes relating to energy management. In 2022, we became the first organisation to achieve the 'Advancing' tier of the Carbon Trust Route to Net Zero Standard, which recognises our progress on our own journey to Net Zero. The standard replaces the Carbon, Waste and Water, and Supply Chain standards which we've held since 2009 and 2015 respectively.

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Publishing policies

Early in our journey, we developed an environmental policy and an energy policy which set out both our targets and our wider commitments to managing our environmental performance, including our carbon emissions.

The policies are reviewed and signed off by our leadership regularly and published internally and externally, formalising our intentions and holding us to account over our actions. They also demonstrate to our stakeholders that our leadership is committed to reducing our carbon footprint.

Agreeing a measurement approach

Having good data is essential to track progress and identify opportunities for improvement. But this doesn't necessarily mean investing heavily in technology and software right away. Indeed, we've chosen to improve our measurement in stages and at times when it made sense from a business point of view.

Our energy management system is one such example. Ten years ago, we used monthly energy data which was more than enough to get us going, and supplemented this with spot tests if needed. Over time, we introduced Automatic Meter Reading (AMR) into many of our offices, which enabled us to analyse our energy profiles and identify opportunities to optimise our energy performance (see "Energy: Operating differently" for more details).

Our greenhouse gas emissions reporting has matured in a similar vein. Having started with just spreadsheets, we quickly invested in a simple reporting tool, based on a facilities management package. This helped us calculate our carbon emissions more efficiently, and provided a single repository of data that various internal stakeholders could access, saving time for everyone involved.

After a few years, however, it was unable to cope effectively with advanced carbon calculations, bespoke estimations, and robust workflow for data sign-off and audit. We opted to upgrade to a more advanced system, designed specifically for sustainability reporting - and which was able to track all our social and environmental impacts across our operations and supply chain (see Deep Dive: Pioneering human led-tech powered sustainability reporting).

In each case, by keeping an eye on our future requirements and opting to invest in better measurement only when we needed it, we've been able to phase the costs so that they could be more easily absorbed into business-as-usual budgets.

Obtaining assurance

Having accurate data gives us confidence to make business decisions and helps us to build trust with our stakeholders. To that end, since 2012, we've received external limited assurance from our financial auditors for all metrics reported in our Annual Report, with our carbon emissions assessed against the ISAE3000 standard (including for our baseline year, 2007) and, more recently, against the ISAE3410 standard, too.

The annual audit provides a useful steer for improvements we should make to our measurement and reporting in the following year. In addition, knowing that our processes and data will be scrutinised has instilled a real culture of ongoing rigour and accuracy in our teams, such that we're always asking the question 'Is this good enough to be audited?'

Creating partnerships

Many of the improvements we've made, either in the way we operate or with the technology we've adopted, have depended on our suppliers and their willingness to support us in trying something new. We sought to identify strong collaborating partners, engaging them early in any project so we could align on expectations, share expertise and agree on a common set of goals. This partnering approach has allowed us to deliver ambitious results, to schedule, and in a relatively short period of time.

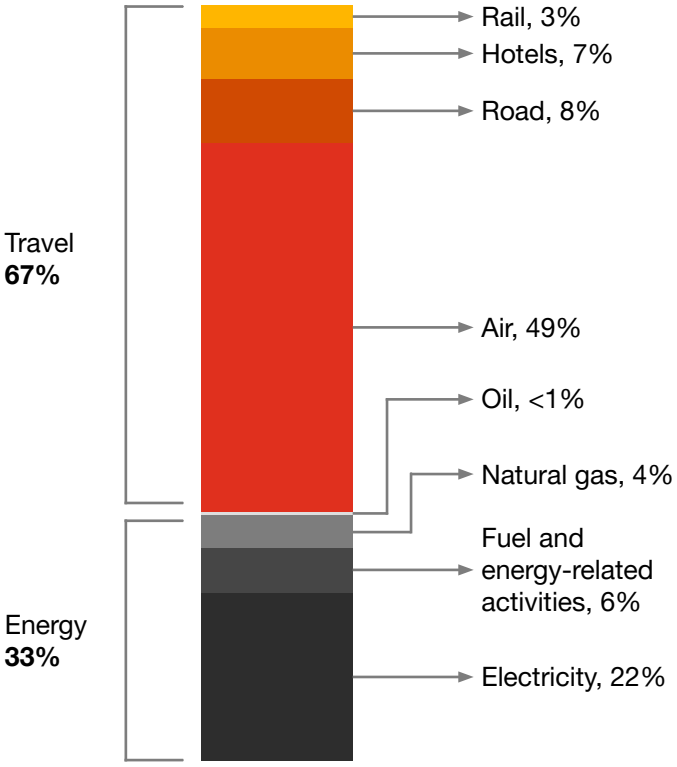
For examples of our partnerships, see our Energy: Consolidating our office space, Energy: Refreshing our real estate **and** Energy: Investing in new technology sections.

How we started our journey

In 2007, we set about measuring our carbon emissions to help us understand where we should focus our reduction efforts. We had calculated a high-level footprint prior to this, but felt we needed a more robust approach to inform our decarbonisation activities and to reflect the growing maturity of carbon reporting. Later, we also sought internal and external assurance of our data, to validate our results. The majority of our carbon emissions in 2007 stemmed from our business travel (67%), notably flights to clients or for internal (i.e. non client facing) purposes. The rest related to energy used in our buildings (33%), primarily electricity (see Chart 1).

Chart 1

Split of PwC greenhouse gas emissions 2007[1]



Defining our scope

We used the Greenhouse Gas Protocol (GHG Protocol) to guide us through the steps needed to measure our carbon emissions. These included setting the boundaries and scope of measurement, agreeing on the material sources of emissions, and estimating for missing data.

At the time, many companies were choosing to only report their scope 1 and 2 emissions, i.e. those related to sources controlled directly by their organisations (such as fuel used in their boilers or company-owned vehicles) as well as purchased electricity. However, since travel was a significant proportion of our total emissions and integral to the way we do business, we felt we should look to understand, reduce and report on travel-related emissions, too.

Calculating our emissions

We started collecting consumption information, and found we could get good energy data from utility bills for the buildings we controlled. Landlord-owned offices and multi-tenanted buildings, however, required more effort: we had to request the data and, in some cases, needed to estimate our share of the energy use, based on the proportion of the total floorspace we occupied. It took a bit of time, but didn't prove to be too difficult.

Travel data, on the other hand, was less straightforward. We were able to get accurate data from our travel service provider on the nature of our business flights, including destinations and class of travel - all of which influence the carbon footprint. But for other modes of transport where bookings were less centralised, we had to use our expenses system and 'convert' the spend back to travel consumption in miles, which required much more manual intervention. Once we had consumption data, the final step was to convert this into carbon emissions using the UK government's carbon conversion factors.

Opportunities for carbon reduction

With energy use in our buildings forming the largest part of our emissions, and with most regulation and reporting in the market focused on scope 1 and 2 carbon emissions, reducing our energy use was a top priority.

Looking at our building stock in 2007, we had 43 offices across the country, many of which were small, and no longer suitable for our business needs. Furthermore, many of our buildings were old-fashioned and in need of refurbishment, with a wide variation in energy performance. This presented us with a great opportunity to embed more energy-efficient ways of working as we consolidated and upgraded the portfolio, and formed the starting point for our carbon emissions reduction initiatives.

Business travel also needed our attention, as it accounted for 67% of our reported greenhouse gas footprint. Flights formed the lion's share of this, at 73% of all travel. A proportion of this was from non client-facing air travel, which was fully within our control, so this was one of the areas we targeted for early intervention. Client-facing air travel was more difficult as it is a necessary part of how we serve our clients. Nonetheless, we still wanted to do what we could and felt there was an opportunity to challenge ourselves and our clients to adopt new ways of working which had a lower carbon footprint. We sought to address this a little later on.

Since first reported, we've updated our 2007 carbon emissions to reflect better data availability, reporting guidance (for instance inclusion of radiative forcing) and the UK government's annual carbon factors. See our Annual Report for the latest data.

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Deep Dive:

Setting our carbon targets

Overview: Our fifteen year journey (2007 - 2022)

Our fifteen year journey to 2022 encompassed three distinct 5 year phases: 2007-2012, 2012-2017 and 2017-2022, ending with us committing to Net Zero with 2030 goals. At each stage, we increased our level of ambition, setting new public reduction targets, and reporting transparently on our progress towards them on an annual basis.

Establishing our targets

Each set of targets was developed by triangulating three different inputs – internal feasibility, national requirements, and the competitor and market landscape. We synthesised these, collating them into a communications message that was simple to understand and compelling to all of our stakeholders.

Feasibility: Having agreed with leadership that our environmental performance was a priority, a modest annual investment budget was set for carbon reduction initiatives where the business case was unproven. This allowed us to 'test' options quickly, without having to request funding for each individual project, and gave us the confidence to set ambitious targets. We then evaluated different solutions to determine what level of carbon emissions reduction might be feasible for our business with full deployment.

National requirements: We also wanted to 'do our bit' towards the national goal, but the UK's carbon budget isn't set at a company or sector level, so we calculated the rate of decarbonisation that would be needed for the UK to achieve its 2050 target at the time of -80%, establishing 'a compound annual reduction rate' which we could apply to our fifteen year time horizon. We compared this against what we thought we could achieve and determined that it wasn't very challenging if we were to opt for a scope 1 and 2 emissions goal only. Instead, we decided to cover all our measured carbon emissions, extending beyond the national goals by including our business travel.

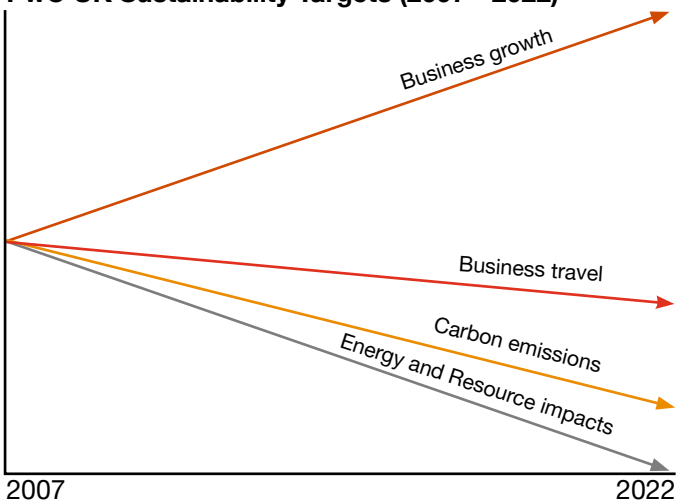
External benchmarking: Next, we looked at a wide range of other companies' targets, including sustainability leaders, to guide us in setting our own. We wanted to know not only how our level of ambition compared, but also how other companies chose to present their targets. Some of our key findings were:

- Whilst most companies focused on their scope 1 and 2 emissions, scope 3 was also included by leaders in each sector.
- Intensity and absolute targets were equally common, although leaders often set both. Today, an intensity target is mandatory for all listed companies in the UK, but absolute targets remain the gold standard and are expected by environmental NGOs and target setting initiatives such as the SBTi.
- When resetting targets, companies often maintained their original baseline.
- There was a wide range of time horizons for targets, including very short and very long term, although one or five year timeframes were preferred, aligning to 'round' numbers or UK government milestones (e.g. 2022, 2030).
- Many companies were early in their carbon reduction journey and had, so far, only set short term targets (below the % reductions required year-on-year over the long term if they were to truly help tackle climate change). See our Net Zero economy index for up-to-date annual reductions needed for each country to deliver the Paris agreement.

Time period: We kept the same baseline for consistency (for our 2012, 2017 and 2022 targets), extending the horizon to fifteen years, which reinforced the long term nature of our journey. Meanwhile, the five-year time horizon was short enough to keep us focused and long enough to be able to implement the changes needed.

Positioning: Despite our business being forecast to grow, we opted for an absolute goal to ensure we were playing our full part in addressing climate change.We wanted our targets to be easy to communicate, too, so that our leadership and stakeholders could get behind them.
The concept of 'decoupling' our carbon emissions from

PwC UK Sustainability Targets (2007 - 2022)



Our goal: to reduce our carbon emissions by 40%, halve our energy and resource consumption, source 100% renewable electricity and reduce our business travel emissions by a third per employee.

our business growth really helped as it was a simple yet bold message that resonated with people. We chose complementary numerical targets for our other environmental impacts to create a memorable, holistic message:

What we've achieved over fifteen years (2007-2022)

By 2022, we wanted to reduce our total, absolute carbon emissions by 40%, halve our energy and resource consumption, source 100% renewable electricity and reduce our business travel emissions by a third per employee. We're pleased with what we've achieved. We've cut the carbon footprint associated with our energy consumption by a full 81%, and our total carbon emissions (i.e. scope 1, 2 and 3 - including business travel, waste and fuel and energy related emissions) by 83%, whilst almost doubling the size of the business. In intensity terms, our scope 1, 2 and 3 carbon emissions per £ revenue have dropped 6% year-on-year, which compares favourably to the scientific rate required to limit global warming to 1.5°C, and to reductions by the UK and G20 over the same period, as reported in PwC's Net Zero Economy Index.

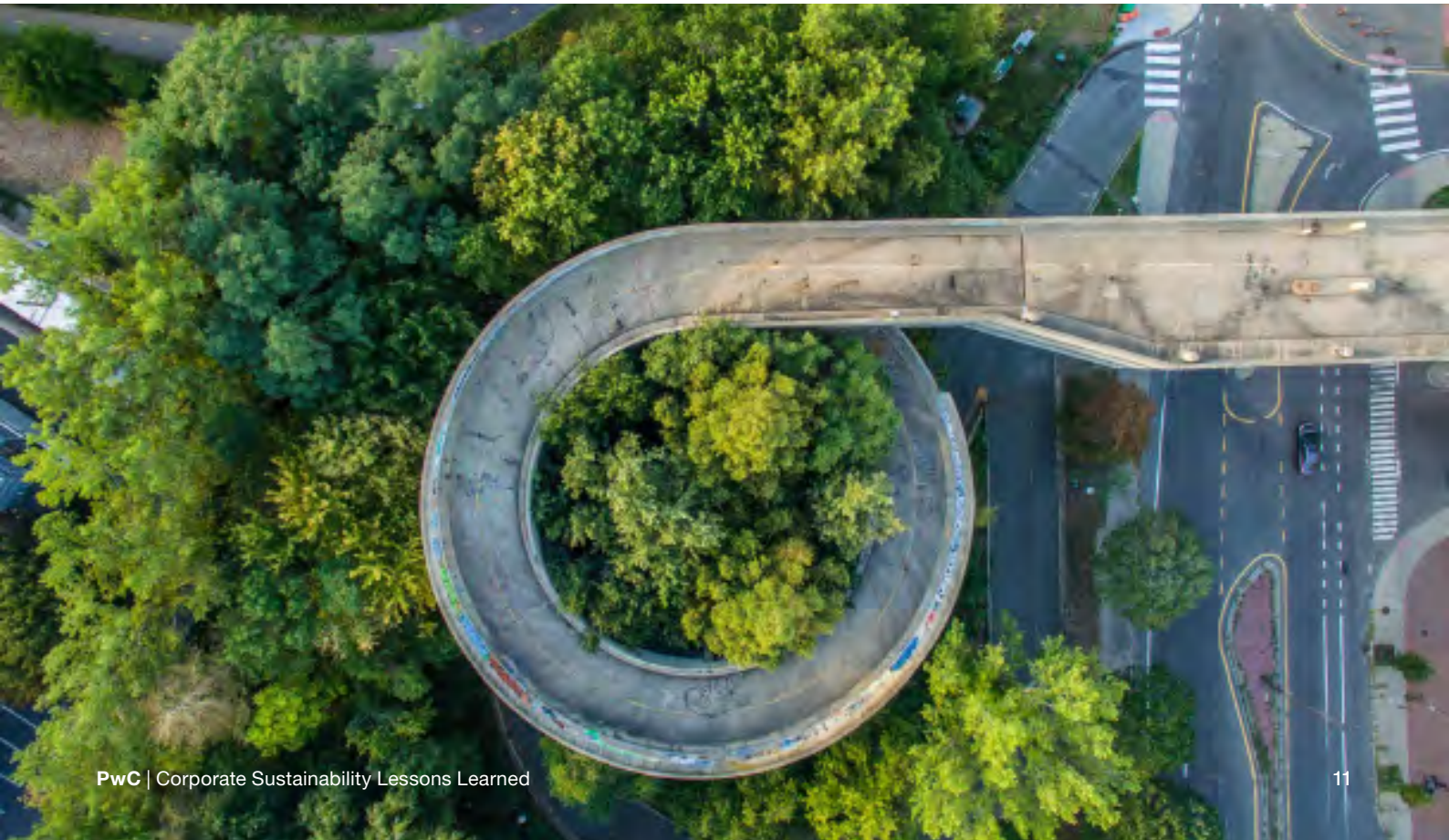
Looking ahead: Setting targets beyond 2022

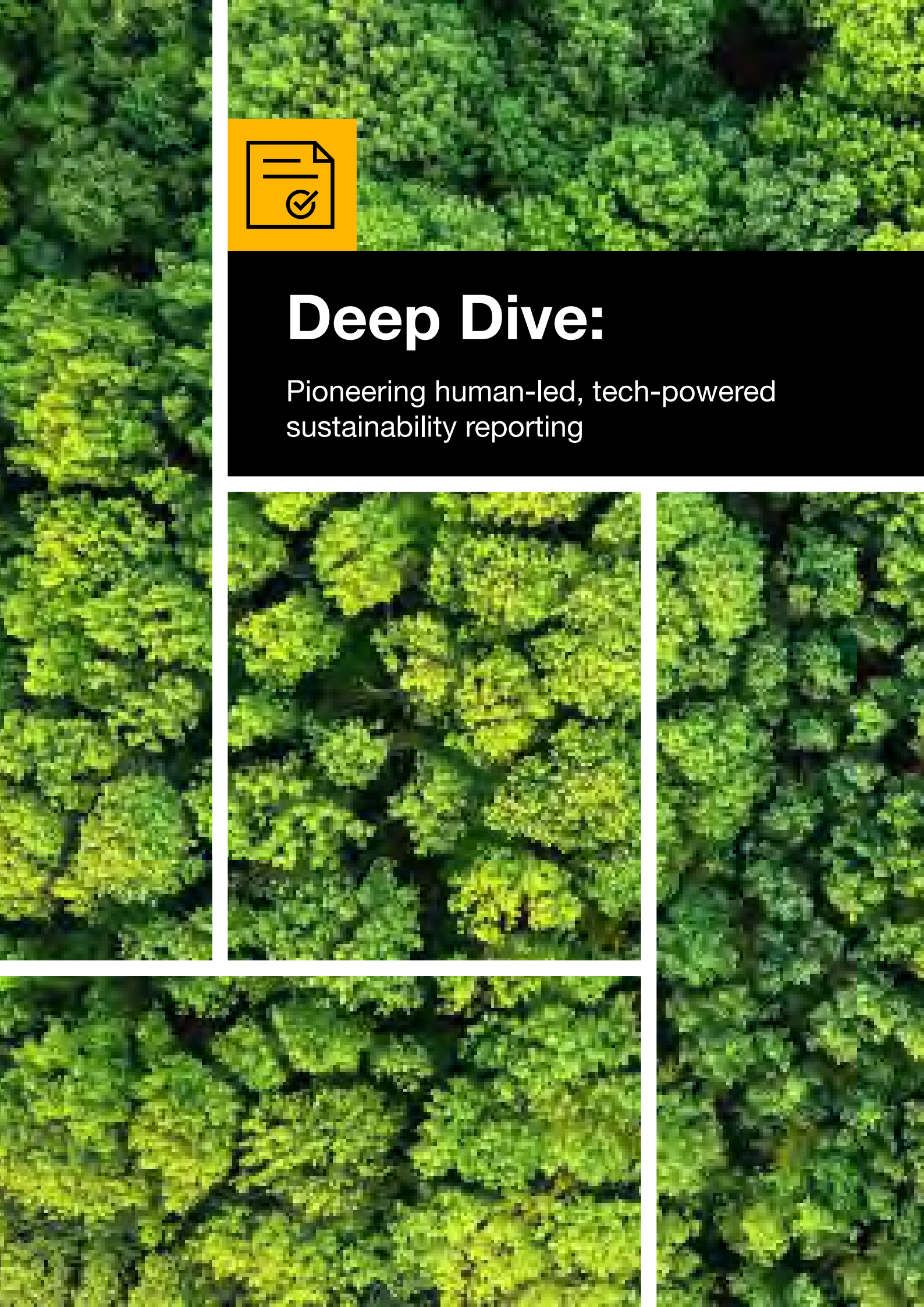
With our fifteen-year targets close to expiry, in 2020 we took a fresh look at where we were, evolving stakeholder expectations, and what we could achieve. The emergence of the Net Zero concept, alongside setting a validated carbon target via an external NGO were both new and uncomfortable concepts. We had to invest significant resources to understand the expectations, how they applied to PwC, how they would align to our purpose or change our business model, whether we could commit, and whether we should. This involved taking senior leadership through the process and getting it ratified both internally and then externally by the Science Based Targets Initiative (SBTi).

Until the emergence of the SBTi, emissions target setting guidance was principles based, allowing organisations to define their own reporting scope, timeframes and ambitions. While many organisations tried their best, the lack of guidance often led to low integrity targets which put companies at risk of 'Greenwashing' acquisitions. The SBTi has provided the necessary structure, defining and promoting best practice in science-based target setting while offering a range of target-setting resources and guidance, before independently assessing and approving companies' targets in line with its strict criteria.

We saw setting a verified SBT as the right thing to do, enabling us to set a robust, credible and 1.5°C aligned target that will hold the business to account, and have since been joined by thousands of other organisations who have done the same. The process was straightforward, and involved us submitting a letter of intent, and then following the SBT criteria to develop a SBT. We then submitted it for approval, before going through SBTi official validation, which involved a two way dialogue focused on scope, coverage and level of ambition - a process which took about six months.

Performing a full GHG inventory was the hardest part of this process, and involved us having to provide estimates for categories that we hadn't even considered before, such as our employee commuting or purchased goods and services. Fortunately there are plenty of open source methodologies and estimation tools out there to help you, and high level estimations are all that's needed. The process was incredibly valuable, as it highlighted how significant our value chain emissions are, and led us to setting an explicit target to manage these, as well as our operational emissions which we'd been managing for the past 15 years.





Deep Dive:

Pioneering human-led, tech-powered sustainability reporting

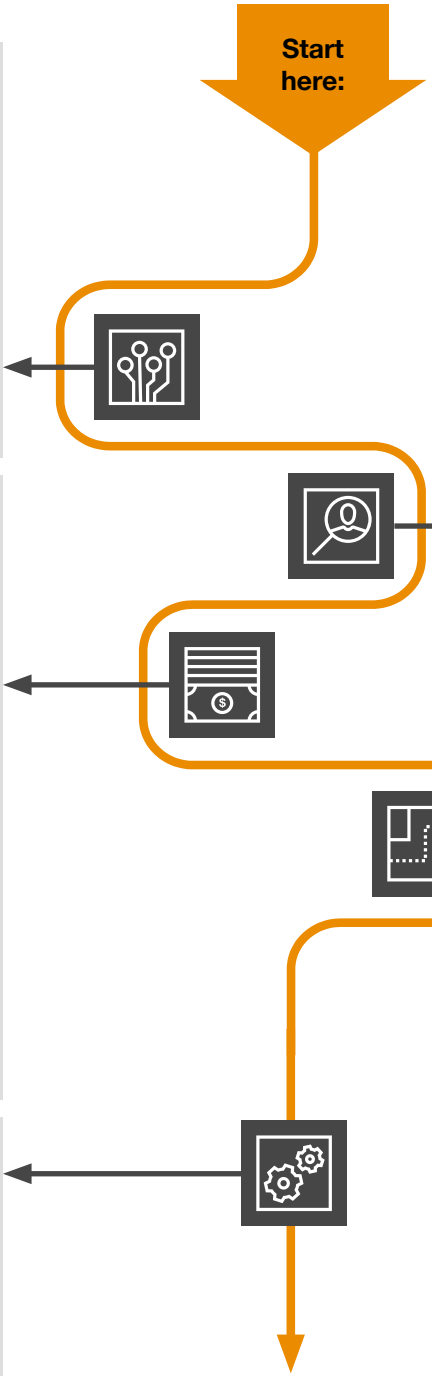
Overview

The systems and processes we use for collecting, maintaining and reporting our sustainability information evolve as our reporting demands change, and new solutions emerge.

For example, back in 2014, our sustainability data ecosystem was no longer fit for purpose. We had 11 years of historic data and an exponential increase in the number of metrics we were collecting, complicated by the range of data sources across the business. Our then-current custom platform had limitations that made it both resource intensive while lacking in controls, automated calculations and reporting capabilities.

Below outlines the process which led to the successful implementation of our current sustainability data platform.

Pioneering human-led, tech-powered sustainability reporting



Scoping our requirements

- You cannot change what you don't measure - accurately - so we decided to replace our previous custom platform which was no longer fit for purpose in terms of data collection, analytics and reporting.
- It needed to be a one-stop shop for all things sustainability to support the multiple external disclosures we produce.
- We wanted a solution that would meet our strict requirements.

Design

- The key to a successful implementation is designing a system that works for you; your data sources, users, and outputs needs.
- We configured the system in collaboration with our supplier to minimise customisation (which is costly and timely to implement and maintain) in order to meet our collection, calculation, storage, and reporting needs.
- Carefully planning the system design enabled us to enhance our reporting capabilities, producing automated reports at various levels of granularity, used for external disclosures (SECR, TCFD, GHG inventory, CRP, etc.) and for the many other reporting outputs.

Final steps - testing

- Finally, we user-tested the system, to ensure practicality, check for errors and stress test the platform.
- This takes several weeks or months, and identifies configuration errors (e.g. if data isn't being aggregated correctly).
- It has also supported in identifying data sources and streams previously omitted.

Selection and procurement

- We performed an extensive market review, assessing 40+ sustainability software suppliers, with 3 invited to participate in an RFP process.
- The RFP covered a series of areas including: user interface, security, data management, data capture, carbon emissions, reporting & analytics, auditability, and innovation.
- A series of supplier attributes were also considered including: company size & fit, quality of responses and responsiveness, expertise & experience, operating model, product lifecycle, pricing, relationship potential, commercial opportunities, and their own sustainability strategy and performance.

Implementation

We split the implementation into three phases:

- Environment: collection of operational data across our office portfolio, from gas and other combustion fuels (scope 1), electricity (scope 2) to waste disposal and business travel (scope 3).
- Social: collection of volunteering data to measure our social impact. For this, we co-developed a custom module, which we used to collect activity level data, including volunteer details.
- Governance: collection of governance data to ensure that we had the right processes and support to meet our external commitments and become a pioneer in reporting and transparency.

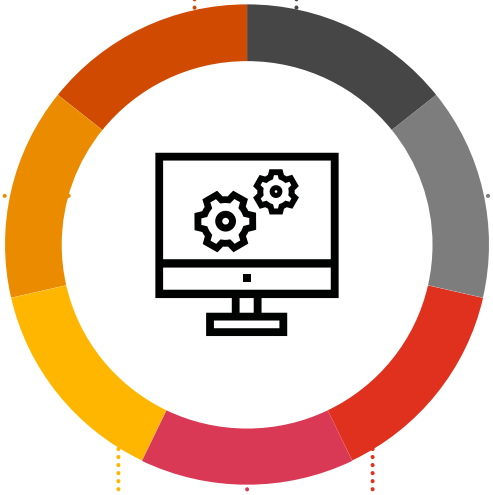
Key software features

Auditability

- Audit trail and other tools and reports to support assurance.

Reporting & analytics

- Visualisation dashboards, for insight, trends, forecast and performance against targets.
- Data export which can be customised/used to schedule reports.



Data capture

- Data collection, tolerance checks and validation rules.
- Automated calculations (e.g. estimates, forecasts, carbon emissions).

Security

- Hosting and seamless access to the platform.
- User group access restrictions and data locks.

Data management

- Certified library of emission factors (maintained by supplier).
- Built in approval process, to improve data accuracy, reduce error.
- Document library to store supporting evidence, manuals and other key documents.

User interface

- Look & feel and overall usability of the platform.
- Automatic notifications for due dates, approvals & missed deadlines.

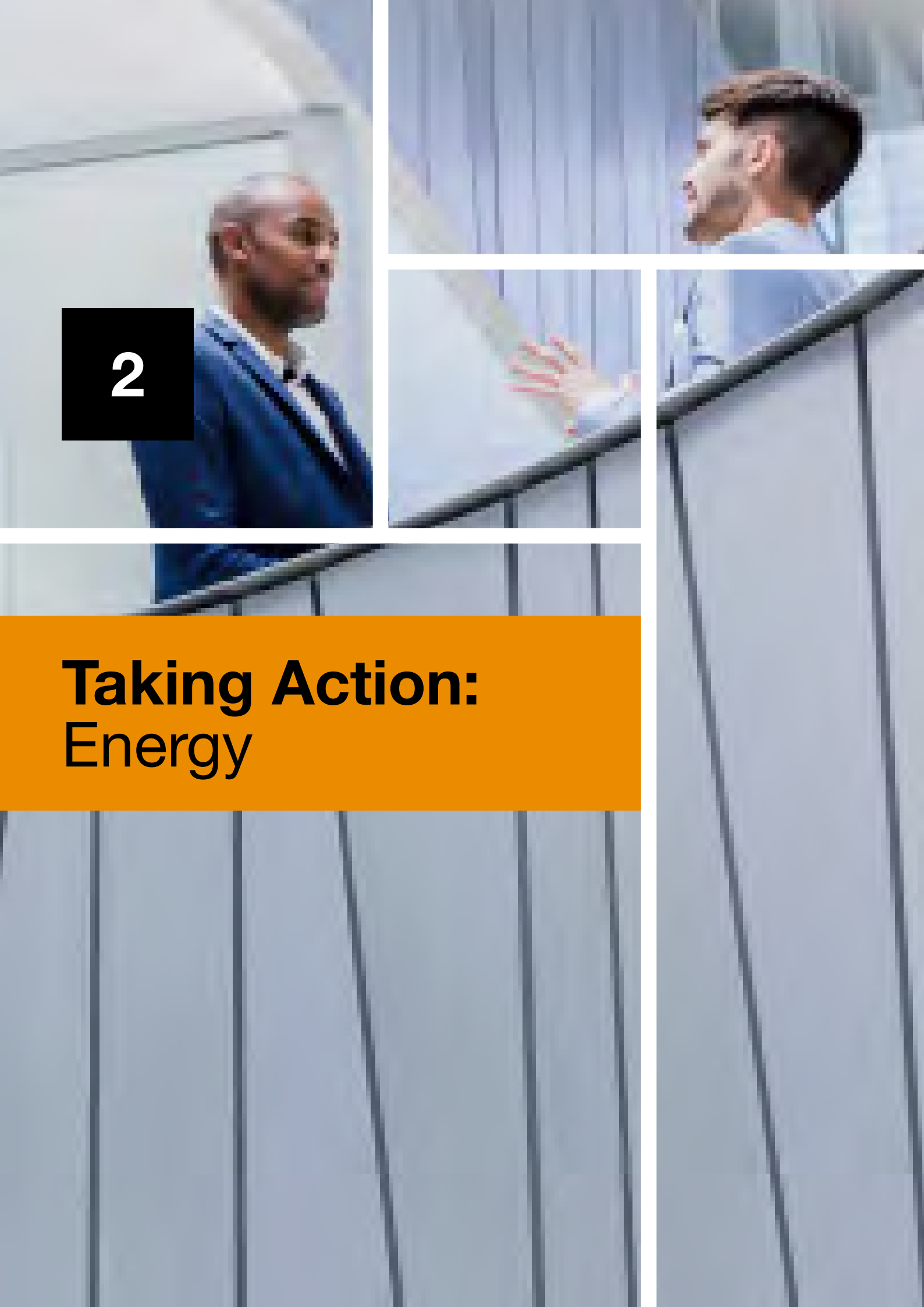
Other features

- Innovation delivered via regular software updates.

A key lesson learnt here was the importance of making sure users receive onboarding training so that they understand the context and importance of the data they are entering to improve engagement and eliminate unnecessary errors (e.g. incorrect use of units).

Looking forward

Our sustainability reporting needs are constantly evolving. By holding open conversations with our platform provider, we're able to set future expectations and influence future product development to meet our needs. Currently, we're assessing how to expand the scope of our data collection to include robust purchased goods and services, commuting and work from home emissions that move away from modelled estimates.



2

Taking Action: Energy

Energy: Overview

We strive to continue to drive our energy consumption down. As our energy programme matured over time, however, the opportunities for big improvements in this area were diminishing against a backdrop of business growth. So, we set a target to maintain a 50% reduction in absolute energy consumption against our 2007 baseline year in spite of this growth. This was surpassed by 2022, where we achieved a 62% reduction.

We did this using four main levers: just under a third came from changing how we operate our buildings; reducing our space from 9.6 to 6.7 square metres per person has contributed 36%; refreshing our real estate or moving to more efficient building stock has contributed 11%; and around a quarter came from investing in new technologies (see Chart 2)

Combined, this equates to 51 million kWh of energy saved – enough to power 3,400 homes for a whole year. Although part of this is a result of consolidating our office floor space, we've still seen a 61% drop in energy use per square metre.

Reducing energy use and switching to clean energy have together delivered around 30% of our scope 1, 2 and 3 carbon emissions reduction (see Chart 3).

Chart 2

Split of energy saving mechanisms (2007-2022)

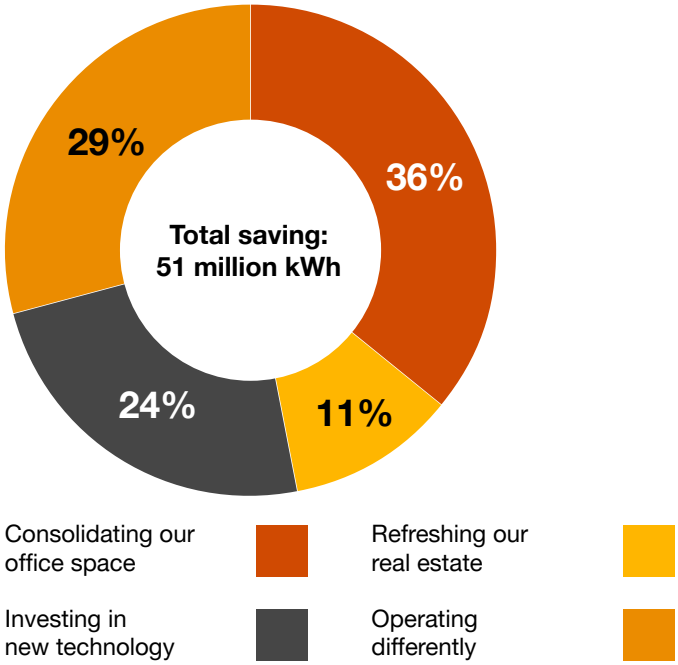
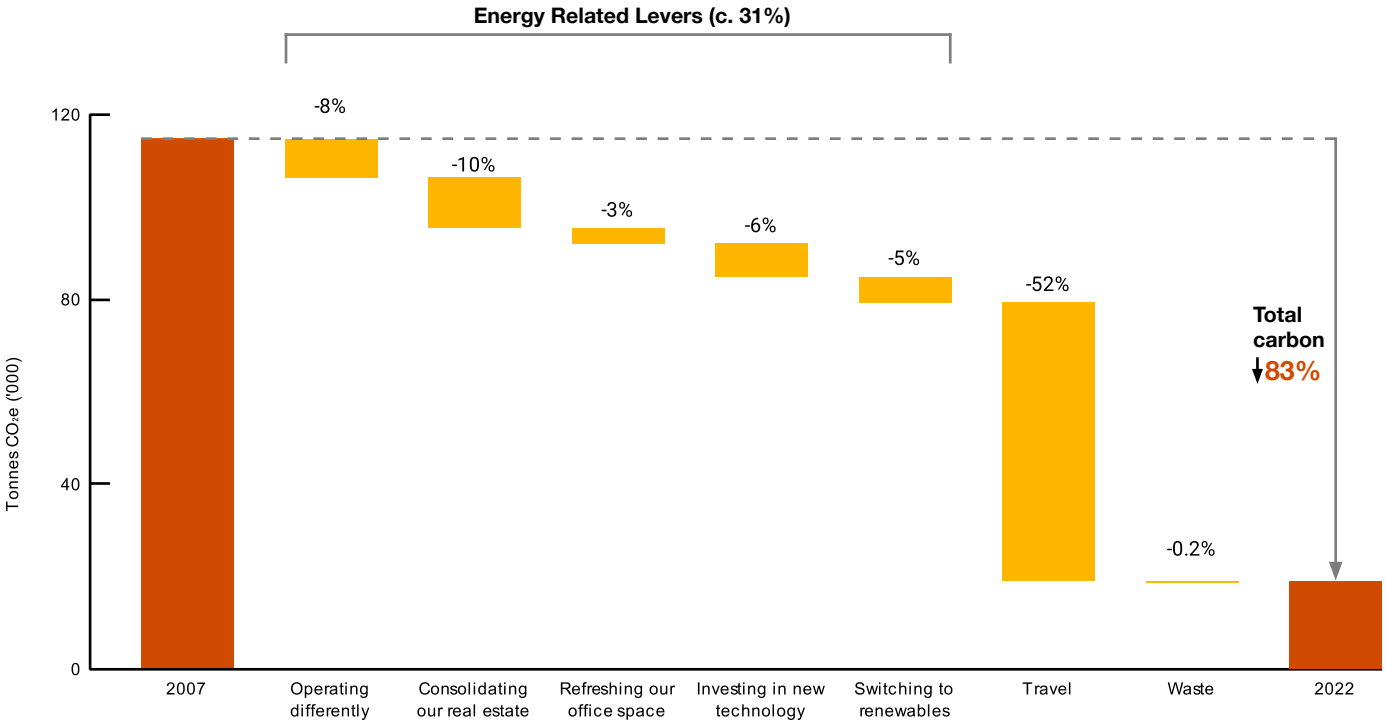


Chart 3

Carbon reduction levers 2007-2022[2]



2. Attributing carbon emission savings to the different energy-related levers is challenging as it depends on the mix of energy sources for each initiative. In general, we've assumed an average energy mix for each initiative although have made some adjustments to suit our business (e.g. all carbon emissions related to oil are assigned to 'consolidating our real estate', as we vacated our oil-powered offices early in our carbon emissions reduction journey). Percentages do not add up to 83% due to rounding.

Energy: Operating differently

As a service organisation, the energy we use in our buildings was the second biggest contributor (after travel) to our reported carbon footprint in 2007, comprising 33%. This made it a priority for our environmental agenda and one where we've focused the majority of our reduction initiatives over the past fifteen years. As a result, in 2022 energy use represented only 13% of our total greenhouse gas emissions. Changing how we operate was mostly about aligning our energy use with building occupancy, eliminating unnecessary consumption and switching to renewable energy. These changes required very little direct investment, but careful planning was critical to avoid business disruption. The main initiatives undertaken are described below.

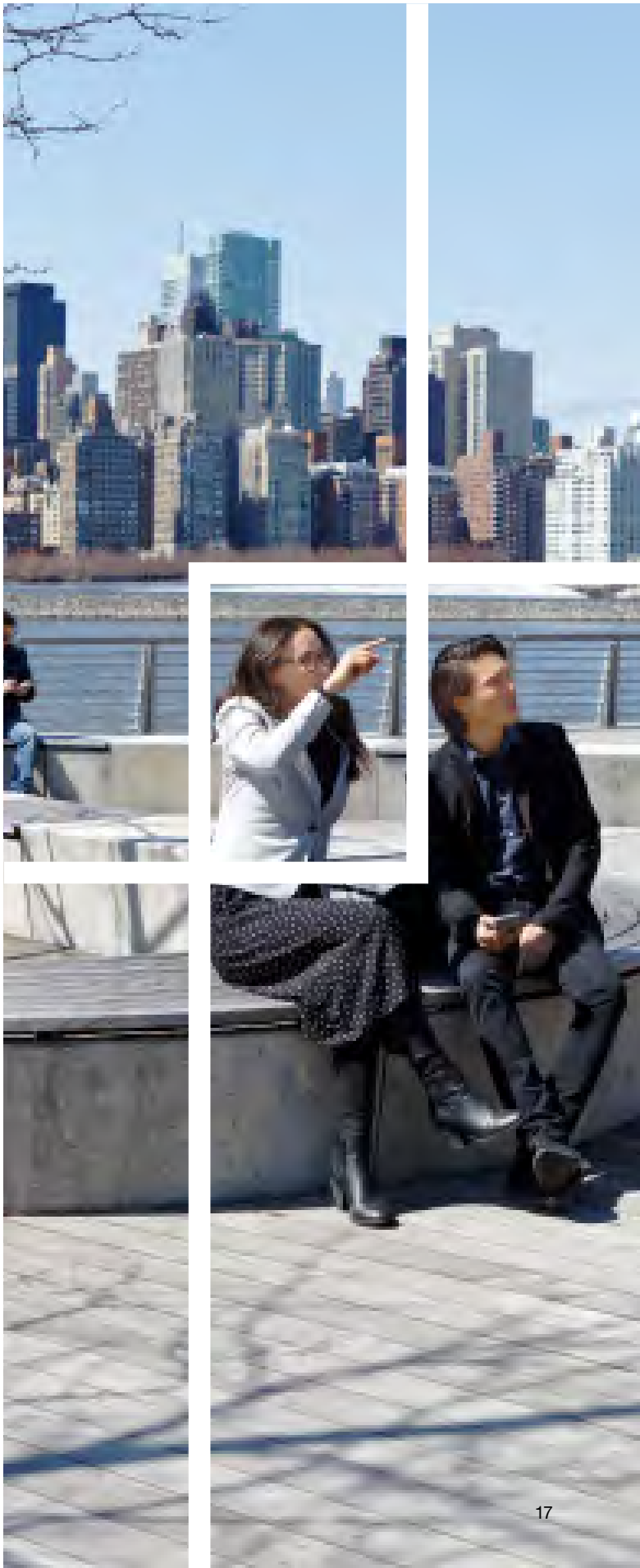
While renewable energy is zero carbon, it can disincentivise further reduction efforts. So going forwards, we're equally focused on the Energy Usage Intensity (EUI) of our buildings, both on an individual building standpoint but also from a UK building portfolio perspective, aiming to reduce this to a level commensurate with a Net Zero future - with guidance rates such as 70 kWh/m^2 (NLA)/year currently tabled by the UK Green Building Council (UKGBC) energy performance targets.

Challenging our operating hours

Back in 2007, our offices had manually-operated lighting which meant that it was often left on unnecessarily. Part of the reason for this was that our cleaners and maintenance contractors were on site out-of-hours, so we moved to daytime cleaning and maintenance, where possible. This not only saved up to 60 hours of lighting per week but also gave our suppliers' employees more sociable working hours. In addition, we performed walk-arounds in our offices and discovered that lights, printers and small power equipment were often left on at night - so, we asked our cleaners to turn them all off at the end of each day.

Managing temperature more closely

During operational hours, we found that we were heating our buildings to a higher temperature than we needed to, wasting energy. In fact, every 1°C reduction in temperature in our offices saved up to 8% of our energy consumption in that area. So, we reduced the temperature where we could, in particular making washrooms and common areas cooler than our practice floors. We also consulted with our IT providers to increase the ambient temperature in our main server rooms from 18°C to 22°C, a move which reduced our cooling requirements and energy consumption in that part of the building by 30%, whilst having no detrimental impact on performance. Where possible, we've outsourced our data centres, increasing their efficiency and reducing surplus capacity. This was supported by maximising the use of cloud based applications and data solutions, reducing on site demand.



Conducting proactive maintenance

When equipment malfunctions, it can consume more energy than needed - for instance, if it no longer turns off when it's supposed to. Conducting proactive, regular maintenance is important to prevent malfunctions occurring in the first place. We routinely check and replace any worn parts and ensure that all of our equipment is running as it should. We also clean our machines, removing restrictions to heating and cooling, such as blocked grills, obstructed radiators, or clogged air filters. This not only helps to extend the life of our equipment and keep costs down, but it also helps all of our equipment to run more efficiently, reducing our carbon emissions.

Using our BMS to drive efficiency

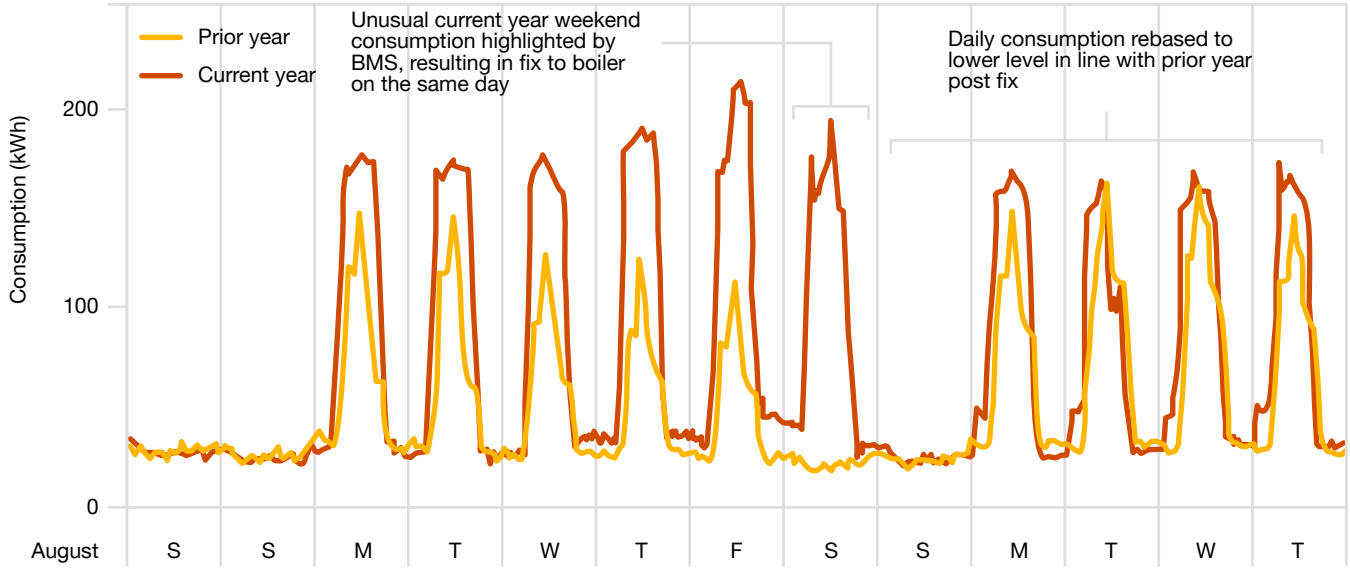
Investing in an advanced Building Management System (BMS) allowed us to go a step further in improving our operational efficiency. It offers sophisticated analysis, assessing power consumption, flow rates and temperatures at the level of individual floors or items of mechanical equipment and allowing detailed and continuous profiling. Better controls allowed us to target lighting, heating and power to only the parts of our offices where it was needed for our consumption. For example, at its most basic, it can compare prior year data and identify when equipment can be shut down (see Chart 4).

Another area where our BMS has been really effective is in identifying conflicts. In several instances, for example, our heating and cooling were operating simultaneously. Investigating these further, we discovered this was caused either by poor installation (e.g. wrong location of sensors, or incorrect programming) or equipment malfunction (e.g. broken sensors or the equipment shutting off). We were able to resolve such conflicts and reduce our energy consumption as a result.

Moreover, our BMS now has software that allows it to control our ventilation, lighting and power which - combined with improved controls that allow different zones in the office to be managed separately - means it can 'learn' how to operate more efficiently. For example, it can automatically work out when the best time to cool or heat the building is, based on when lighting systems are in use - a feature that is particularly useful given that the needs and working habits of our people are constantly evolving.

We're still learning how to get the most out of our BMS and are constantly finding new opportunities for energy reduction. Most recently we've implemented a 'smart buildings' platform that works in parallel with our BMS. The new system gathers data directly from our BMS, giving us a platform to view live data and interrogate the energy use for each individual piece of equipment in the building. We are then able to implement operational parameters on each meter, with any breaches to these being flagged to our onsite engineers for investigation.

Chart 4



BMS data showing year on year energy consumption – highlighting a growing gap between consecutive years, and culminating in a significant anomaly at weekend. Current year consumption drops and tracks in line with prior year from the day of corrective action.

Achieving 100% renewable electricity

Where possible, we've switched to low-carbon alternatives for energy in our buildings. In 2022, 93% of our total energy was sourced from renewables, supported by 1.8 MWh of onsite capacity via our trigenerators and photovoltaic panels.

Since 2015, we've been buying electricity from renewable providers where possible, backed by Renewable Energy Guarantee of Origin (REGO) certificates, for all the mainland UK offices that we operate ourselves. We then encouraged the majority of our landlord-owned buildings to switch to renewable tariffs. For the remaining electricity that is not covered, we purchase unbundled Energy Attribute Certificates (EACs), hence reaching our 100% renewable electricity target by 2022.

Originally, our trigenerators were run on recycled cooking oil, however they have since been retrofitted to run on 100% carbon neutral biogas, backed by Renewable Gas Guarantees of Origin (RGGO) certificates.

The remaining 7% of energy is landlord-controlled natural gas consumption, which we're aiming to phase out from our portfolio.

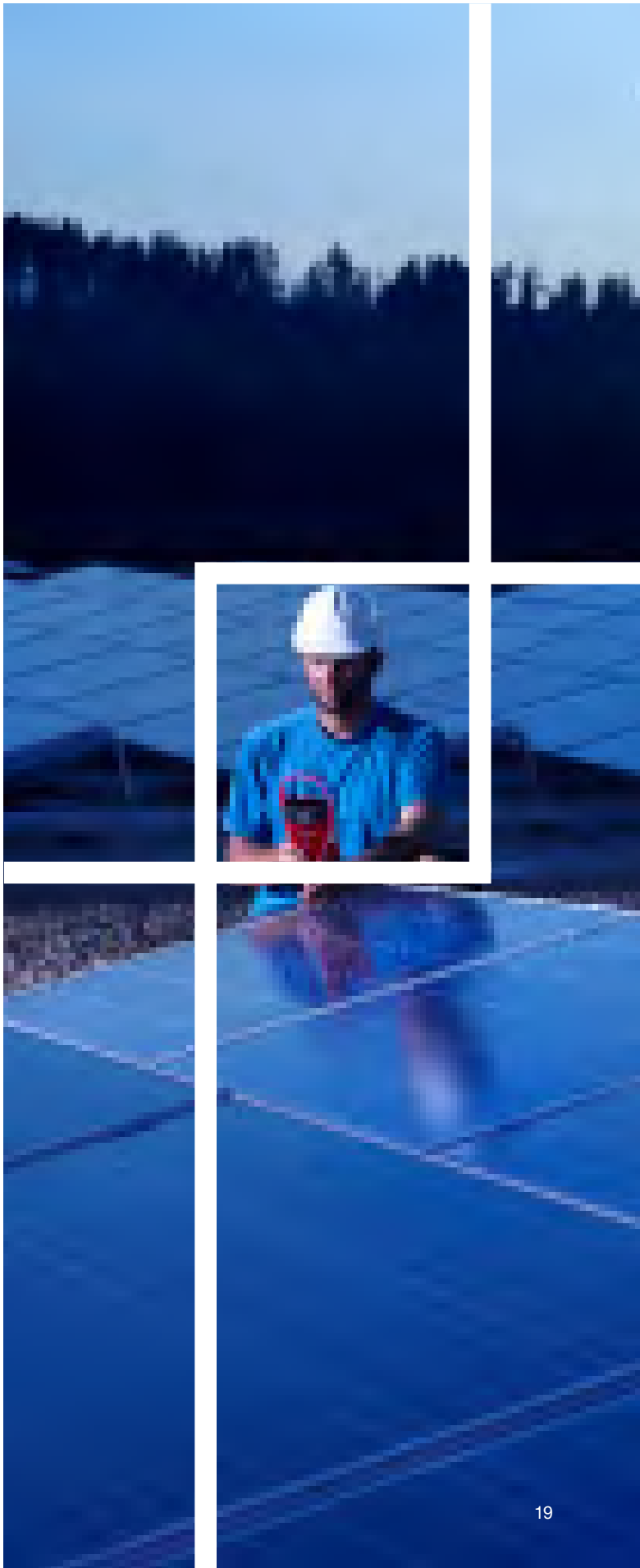
While renewable energy is zero carbon, it can disincentivise further reduction efforts. So going forwards, we'll be equally focused on the Energy Usage Intensity (EUI) of our buildings, both on an individual building standpoint but also from a UK building portfolio perspective, aiming to reduce this to a level commensurate with a Net Zero future - with guidance rates such as 70 kWh/m^2 (NLA) / year currently tabled by the UK Green Building Council (UKGBC) energy performance targets.

Challenges to consider

In the past, it's been challenging to engage with landlords and managing agents on securing renewable energy contracts for buildings not within our direct control. One solution to overcome this has been to engage and work with other tenants occupying the building to leverage a wholesale switch to renewable energy.

Luckily, with the recent drive for businesses to reach Net Zero, and with policies emerging surrounding building efficiency, landlords are becoming easier to engage on this topic. The risk of buildings becoming stranded assets is highlighting the importance of investing in building efficiency and renewable supplies. See 'Deep Dive - Where to start in your office' for more information on working with landlords.

Most recently, the ongoing energy crisis which began in 2022 caused a fluctuation in renewable energy prices, which made it very difficult to switch suppliers and has created a barrier to those beginning their journey. To address this, having a longer term strategy in place to secure a renewable energy supply would provide a safety net for any future issues. An example of this could be entering into a renewable Power Purchase Agreement, where appropriate.



Energy: Consolidating our office space

At PwC UK, we have a rolling real estate portfolio enhancement programme. This is necessary to ensure that our buildings support our business strategy, by providing suitable office space for our people and clients. We renew our buildings in line with the latest working styles and in response to our changing business populations, with an eye on cost and productivity.

But improved environmental performance has also been a key aim, and the real estate renewal process has provided several effective ways to reduce energy consumption and the associated carbon emissions. Primarily, we've saved energy through reducing the space we occupy, either by making more efficient use of our space, or by consolidating our offices. Secondly, we've upgraded our buildings to maximise energy efficiency.

Using space inside our offices more efficiently

Following Covid-19, our people now spend less time in our offices, and more at client sites or working remotely. When on site, they're also working differently, requiring different types of space. This has led us to rethink how we use our offices, to better serve our people's needs whilst reducing our carbon footprint.

One of the most successful ways we've done this has been switching from permanent desks to a hot desking system where our people 'check in' to a desk for the hours they need it. This has increased our average people per workstation - achieving 1.7 in our latest office in Belfast - and by occupying less space, we're not heating or lighting as much. However, it's important to note that this number may fluctuate, due to the variance in daily office occupancy caused by hybrid working. We built up a picture of the demand for desks by conducting surveys in our offices, interrogating our 'access control' data from security gates, and using our BMS to see which areas of our offices were used the most.

Another driver of our energy reduction involved identifying the underused areas of our buildings and putting them to better use. For example, we found that the restaurant areas were only in use for a few hours a day, so we converted them into booths where our people could not only eat their lunch, but also hold informal meetings at other times of day, adding foldable doors for privacy and noise control. We removed allocated partner rooms (i.e. the owners and leaders of the business) and instead fitted these out with furniture and conferencing equipment, while also adding them to the room booking system, enabling all staff to use these as meeting rooms.

We've also created more collaboration spaces (e.g. 'breakout' areas, meeting or seminar rooms, etc.) to reflect the latest ways of working and allow us to engage in different ways with our clients. Further, 'E-lockers' were recently introduced, enabling those who require it to 'rent' a locker for a specified amount of time, rather than assigning one to each individual, which takes up unnecessary space. This has increased the area available for workspaces.

Consolidating our portfolio of offices

Consolidating our offices has helped us move towards a more energy efficient portfolio, as well as bringing our people together from different locations to increase networking and connectivity.

To accommodate hybrid working, we have strived to create sustainable office spaces that our people want to be in — while still serving local markets. Over the past fifteen years we've consolidated our offices from 43 down to 19, while using smart ways of working to house an extra 6,000 people, almost a third of our 2007 workforce. This has reduced the space we occupy per person by 31% and our energy needs per person by 73%. We've also rebalanced the distribution of our people from a previous proportion of 60/40 (London/ regional offices) to 50/50, demonstrating our commitment to our regional offices.

We try to time these moves with the end of leases on our buildings, or with natural break clauses, to keep costs down. These changes present us with great opportunities to use the spaces more effectively and to benefit from economies of scale by housing more people in one location. For example, consolidating into a smaller number of bigger offices can improve the business case for investment in some types of equipment that reduce energy consumption and may be better suited to larger properties (see Chart 5).

Energy: Refreshing our real estate

We've been able to save considerable energy, cost and associated carbon emissions by refreshing our offices across the UK. This has involved two main methods. For smaller offices, we've relocated to newer, pre-existing buildings, which offered lower energy losses and a smaller carbon footprint. For larger offices and locations where we were expanding, we've designed our own sustainable buildings, either from scratch, or by retrofitting our existing properties.

Relocating to more efficient offices

Relocating can be extremely disruptive and takes a lot of effort to get right, so our decisions to move aren't taken lightly. In each case, we first carefully assess whether we could retrofit our existing offices, as we did at our headquarters at Embankment Place in London.

But, if the building is too small for our needs, if the construction and design is too old to be able to get up to good working and environmental standards, or if we have little influence over it because it's a tenanted building, we may consider relocation and our operational and real estate teams collaborate to proactively identify ways to improve our environmental performance.

As a result, we usually see an instant improvement in our carbon footprint. In Belfast, for example, we moved around 400 people to a new office in 2021, which, despite the floor area being double that of the office it replaced, is 37% more efficient.

If operational control for a new office lies with the landlord – when we're only looking to occupy a few floors in a building, for instance – we engage with the landlord early on, before committing. This gives us confidence that we'll be able to work together to meet our energy and carbon objectives.

Designing sustainable buildings

Over the past fifteen years, we've worked with architects, engineers and construction companies to design many of our own buildings, either as new builds or retrofits. In each case, we've aspired to the highest sustainability credentials we can, using the BREEAM standard, a leading sustainability assessment method for buildings, as guidance for our design decisions. We take every aspect of building design that could influence our carbon emissions into account, including the structure, internal layout, technology and operational practice.

One of our first considerations is how to maximise the use of daylight. For a new-build office, choosing the right shape and orientation of the building can really increase the amount of natural light, as does including as many windows as possible – both our More London and Leeds office have walls of glass to let the light in. When we retrofit an office, like at Embankment Place, it can be more difficult as the structure can't easily be changed. Here, we used the atriums to bring daylight down through the middle of the building. We also moved to an open plan layout, removing any offices and other obstacles which were blocking light from reaching into the centre of the building.

Inside the offices, we've introduced state-of-the-art technology which minimises energy consumption. In fact, we've found that implementing innovative technology for an entire building has huge benefits because we can ensure it all works together effectively. Our efficient chilled beams in More London work in conjunction with our trigenerators, for instance, and our intelligent lighting complements natural daylight by automatically adjusting lighting levels. Considering technology holistically has not only allowed us to minimise our carbon footprint but also helped to keep the costs down. The interior layout can help reduce energy consumption, too. We've introduced central staircases, wherever possible, encouraging our people to walk around our offices instead of using the lifts.

Our passion for designing sustainable buildings has helped us achieve the highest BREEAM rating, 'Outstanding', for three of our large offices (see 'Energy: Raising the bar in green buildings' below). Additionally, our Belfast office which opened in 2021 was the first office in Northern Ireland to be awarded the BREEAM 'Excellent' status.

Energy: Raising the bar in green buildings

We've achieved a string of 'firsts' as we've sought to design different types of green buildings, showcased below. As a result, we now have more than 16,000 of our people located in some of the most innovative and environmentally-friendly buildings in the UK.

One Chamberlain Square, Birmingham

Achieved BREEAM offices 'Excellent' for both new construction and fit out.

Statistics:

- BREEAM (Refurbishment and fit out 2014) score Outstanding 72% (in design)
- 7.2 m^2 per FTE
- 100% renewable energy
- EPC rating B 36
- Zero waste to landfill
- Green roof? yes

Overview:

Our move to this landmark new building in January 2020 signified the firm's continued growth in the Midlands. The firm's 2,000-strong team occupies all of the commercial space in the 7 story, 14,500m^2 office building. PwC chose to manage the whole building, providing complete control and influence over future running and Net Zero commitments. To ensure sustainability was placed at the centre of the design, we collaborated with suppliers to implement new technologies and processes, aligning with our low carbon and circular business principles.

Key features:

- Runs on 100% renewably sourced energy, with electricity being sourced from 100% UK wind and solar, and gas supplied from 100% UK sourced biogas, derived from waste food and crops generated from an anaerobic digestion process.

1 Embankment Place, London

First retrofit office to achieve BREEAM offices 'Outstanding' rating.

Statistics:

- BREEAM (Offices 2008) score Outstanding 96.3% (in design)
- 7.2 m^2 per FTE
- 100% renewable energy
- EPC rating A 22
- Zero waste to landfill
- Green roof? yes

Overview:

Our London headquarters, housing 5,000 of our people in a nine-storey 32,600m^2 building which 'floats' above Charing Cross train station. We retrofit the building over a period of nearly two years, completely overhauling the building's internal infrastructure, whilst part-occupied by our people. The office now emits 90% less GHG emissions and consumes 40% less energy (compared to the same building before the retrofit), while generating 38% of its energy onsite from low carbon sources.

Key features:

- Central atrium, removing offices which were previously in the middle of the building and adopting an open plan layout, allowing natural light to penetrate all floors.
- Two 0.3 MWh tri-generators previously run on used cooking oil, but could also use regular diesel to start up. Like our More London office, these are now run on 100% carbon neutral biogas backed by

Merchant Square, Belfast

First office in Northern Ireland to achieve BREEAM 'Excellent' rating for retrofit.

Statistics:

- BREEAM (Refurbishment and fit out 2014) score Excellent 71.8% (in design)
- 7.0 m^2 per FTE
- 100% renewable energy
- EPC rating: A 25
- Zero waste to landfill
- Green roof? no

Overview:

Our largest office outside of London, we are the sole tenant of this 20,000m^2 building, accommodating 3,400 of our people across 9 floors. Being our most advanced workplace to date, with sustainability at the core of its design, it is perfectly positioned as an enabler for PwC to meet its future Net Zero targets, through the focus on sustainability, agility and the ability to flex space to match supply with demand. Innovations have been implemented to drive the firm's agile initiatives and commitment to Net Zero.

Key features:

- Designed to operate solely from electricity, negating any need to use fossil fuels for heating. This means it uses about half as much energy per square metre than the previous office and is now running on 100% renewable energy.
- Materials from the old building reused, and 97% of all furniture, fixtures and fittings from the old

- A Dali Lighting system and LED lights with occupancy and daylight sensing provides energy-efficient lighting throughout the building.
- An intelligent BMS with integration across all systems, with an integrated energy management system that learns the building's usual daily consumption profiles.
- The ability to control specific floors with the HVAC system, allowing a modular approach to running the building depending on occupancy.
- Freespace PIR sensors installed at every worksetting, with display screens showing worksetting usage and availability, providing live utilisation data and enabling efficient space management.
- Metering and submetering systems to monitor energy use
- Cycle parking, showers, drying room and lockers installed to meet BREEAM criteria for 3000 occupants.
- Water consumption and leak detection installed.
- 'Going Circular' with redundant furniture from the previous office.

Challenges overcome:

In January 2018, the main contractor went into liquidation. All construction activities ceased and the delays moved the planned occupation date from June 2019 to an unknown time. With determination, resolve and renegotiation the building and fit out was completed by Christmas 2019 under a new contractor.

The project completion date was to a very tight timescale due to the lease expiry date at the old Birmingham office.

We also had to separate our power supply with the tenants on the ground floor, which caused further difficulties, considering the timescales.

Renewable Gas Guarantees of Origin (RGGO) certificates.

- Efficient chilled beams to replace air conditioning, and regenerative lift braking.
- Hotelling system which allowed us to provide more collaboration spaces and fewer fixed desks, accommodating 700 additional people and saving energy.

Challenges overcome:

Retrofitting a property provides much less freedom than a new build, restricting the technologies and designs available. For instance, insulating the property was difficult, and being unable to make it airtight meant we couldn't totally avoid heating and cooling losses.

For cost reasons, we chose to perform the whole refurbishment whilst still in occupation. To minimise disruption to our people, we refurbished the building one half at a time, relocating people to new floors as they became available. Any disruptive work, such as when the power needed to be down or the entranceway refurbished, was constrained to evenings and weekends.

The office is also located on one of the busiest streets in London, so it was critical that we minimised disruption to the local area. We achieved this by holding workshops with relevant stakeholders (including neighbouring businesses, local residents, and the railway and tube station over which our building is suspended), to ensure our plan was respectful of their wishes, particularly with regard to noise and timeliness - but this did make the project considerably more complex to oversee.

office were donated to 55 charities, social enterprises, community groups and schools.

- Uses much of the foundations and structure of the original buildings, thereby reducing the amount of embodied carbon from construction.
- Modular VRF HVAC system which enables the building to utilise space efficiently by turning off areas and floors when they are not being used.
- Sophisticated iBMS system which controls all of the systems within the building including a Dali controlled lighting system incorporating daylight sensing.
- Smart storage and powered USBC connectivity to remove 'anchors' inhibiting fluidity of occupation required to meet Net Zero aspirations.
- Cycle parking, showers, drying room and lockers installed to meet BREEAM criteria for 3000 occupants.
- Enhancing the hybrid working experience, active face and voice tracking and bluetooth connectivity was implemented in meeting rooms.
- Removal of post pigeon holes, central file drop and reducing MFD's to support the firm's digitisation.

Challenges overcome:

When PwC initially acquired the building, each floor only had 1 PIR light sensor at the entrance. This meant that when movement was detected in one area, the light fitting for the entire floor would be activated. This was especially apparent during out of hours office time. To overcome this we installed separate PIR sensors in each fitting allowing greater control and resulting in drastic energy savings.

Another challenge stemmed from an initial shared water supply with the retail units on the ground floor. In order to allow the office's routine hygienic maintenance and flushing on weekends, we had to turn off the retail unit's water, which was very disruptive. To overcome this we created a separate supply.

Energy: Investing in new technology

New technology provides us with a great opportunity to reduce carbon emissions in our buildings. We've chosen to pioneer a number of solutions over the last fifteen years, not only contributing to our carbon reduction targets but 0also forging the way for others to adopt the technology in the future.

Evaluating technology options

When deciding which technologies are appropriate for our buildings, we conduct life-cycle cost analysis[2] of each technology and look for a payback within the period of the lease. Using the lifecycle cost is important as it allows us to take into account the lifespan of the technology, the cost of implementation and any maintenance costs. In general, we try to invest in new technology when our existing equipment is approaching the end of its serviceable life, or when we're refurbishing an office, so we can install the new technology more easily. But where the benefits have clearly outweighed the costs, we have replaced equipment early, or brought office refurbishments forward.

In parallel with our cost assessment, we estimate the carbon and energy savings of adopting each new technology in our offices. This allows us to select a portfolio of technologies that fits within our energy investment/innovation budget and also meets our carbon emissions reduction targets. The new technology landscape is constantly evolving, so we re-evaluate this on a regular basis.

Table 2
Primary energy and carbon saving technology options used by PwC UK

Technology	Carbon Saving	Marginal Cost	Comment
Lighting controls systems	High	££	Advanced lighting systems that reduce lighting demands by both monitoring natural light levels and only topping up where needed, as well as sensors that control lighting based on where people are in the building.
Integrated BMS(3)	High	£££	Multi-sensor buildings management system. Allows continuous energy performance monitoring by building, floor or individual asset.
CCHP(4)	High	£££	Tri-generators (CCHP) provide electricity, heat & cooling efficiently. Can be run off biofuel for further carbon savings but are large, so not suitable for all offices.
Absorption chiller	High	£££	Cooling system that uses waste heat from a CCHP (see above).
Occupancy sensors	High	£££	Occupancy sensors within the office space allow quantitative data driven decisions, analysing the amount of people present within each floor of a building. This type of data contributes towards business decisions related to how we operate our buildings, optimising floor space, with an overall aim of reducing energy consumption.
Variable speed drives	Medium	££	Controls that allow heating and cooling pumps and fans to operate at the speeds necessary to meet demand, avoiding oversupply.
Heat recovery	Medium	££	Collection and reuse of waste heat from heating, cooling and ventilation.
Modular boilers	Medium	££	Linked modules which can be controlled individually, replacing large single boilers. Increase flexibility and reduce oversupply of hot water.
Brise-soleil	Medium	££	Solar shading to reduce heat losses, and avoid excessive solar heating.
Voltage optimisation	Medium	££	Technology that stabilises the electricity supply at the optimal level for equipment, saving energy. Works best with older equipment.
LED - Newer specifications	Medium	££	LEDs use up to 85% less energy than older lighting and last for up to 25 years. Further, upgrading a building's LEDs to newer specifications has proved to have additional energy savings of circa 30%.
BMS HVAC - run times	Medium	£	Cutting back AM/PM HVAC run times on a building can result in considerable savings in operational energy. The greater the thermal performance of a building the more drastic reductions in the run times to be made.
Point-of-use taps	Low	£	Water heaters at point of use that are more efficient than boilers or kettles. Only heat water when and in the amount needed and avoids distribution losses.
Smart lifts	Low	£££	Programme that optimises lift journeys, based on destinations. Converts braking energy into electricity. Best suited to buildings with a bank of lifts.
Photovoltaics	Low	£££	Solar panels which generate electricity on site. Requires adequate space and conditions to install and operate.
Solar thermal panels	Low	£££	Solar panels which heat water. Adequate water temperature depends on solar conditions and distance to taps.
Air quality and CO_2 monitoring	Low	£	Assessing the building's air quality and CO_2 levels to enable more efficient control of HVAC systems.

2. https://www.wbdg.org/resources/life-cycle-cost-analysis-lcca
3. Building management system
4. Combined cooling, heat and power

Before we invest in new technology, we look to make our own assessment of how well it is likely to perform in our buildings. In some cases, we've asked existing users about their experiences. But many of the technologies are unproven and so we need to test them ourselves to check we can achieve the benefits claimed. If the cost of a technology is prohibitive but has great carbon reduction potential, we've sometimes been able to share part of the cost with suppliers or landlords interested in partnering with us to trial it.

This approach has given us the confidence to embrace some of the new solutions and turn away from others. We tried solar thermal panels in our More London office, for example, to supply hot water to our bathrooms. Unfortunately, the daily demand outstripped the heat available from the solar system, and electric water heating was needed to obtain the desired temperature during business hours.

Upgrading lighting

With lighting representing around 40% of our energy consumption in 2007, it was a priority - and also one of the easiest areas for us to save electricity. At the time, LEDs were prohibitively expensive, so we started by upgrading our fluorescent lights with more energy-efficient models: we switched from T8s to T5s, producing a 60% reduction in energy consumption across our buildings - equivalent to a saving of £30 per fitting, per year.

LEDs reduce energy consumption by up to 85% when compared to our old fluorescent lighting and last up to 20 years longer, meaning drastically lower maintenance costs and waste. As the cost of LED lighting dropped, we gradually rolled it out across our offices, with the majority of our sites now fully LED. We continue to make further improvements where possible, and are currently upgrading our current LEDs to a newer specification which are 30% more efficient.

Improving lighting and heating controls

Turning off lighting and heating out of hours had been our first step in reducing our energy consumption. But there were still times when our offices were only partially occupied and we were using more energy than needed. So, we invested in lighting and temperature controls to create independent zones on each floor. These allowed us to light, heat and cool specific areas of the building on a needs-only basis, further reducing our energy consumption.

Initially, we invested in temperature sensors as well as daylight sensors and presence detectors, such as PIR. We've since gone a step further, investing in digital addressable lighting interface (DALI) systems which give monitoring and fully automated control of each lighting device from a central system.

Our building control systems allow us to tailor heating, ventilation and cooling operations to suit our specific occupancy times rather than switching the plant on and off at set times, therefore reducing energy wastage.

Installing voltage optimisation

This reduced the incoming mains voltage from 240v down to 220v (the EU standard voltage), lowering our electricity consumption. This meant our equipment could operate more efficiently, helping us see a reduction of around 7% in those buildings.

Controlling motor speeds

By installing variable-speed inverter-driven motors, we've been able to significantly reduce the electricity used for our heating and ventilation by up to 40%, compared to previous fixed-speed motors.

Embracing cleaner fuels

Alongside reducing our energy consumption, we've moved to cleaner fuels to help reduce our carbon footprint.

We installed tri-generators into our London offices which produce up to 20% of the buildings' energy requirements. These not only generate electricity, heat and cooling efficiently, but they have recently been retrofitted to run on 100% carbon neutral biogas (having previously been run on a biodiesel made from 100% used cooking oil), reducing both our carbon footprint and our dependence on the grid. They also integrate with absorption or adsorption chillers, reducing our energy requirements by using waste heat to produce chilled water which is then used for cooling.

Generating hot water more efficiently

We offer our people hot water so they can make drinks at work. Historically we provided kettles. But this was inefficient, both requiring a lot of energy and wasting people's time as they waited for the kettle to boil.

So, we switched to point-of-use hot water systems in all of our offices, providing convenient, instant hot water. They heat water more efficiently, with less wastage, and use a lower wattage heating element (1,800W) compared to the 2,000W needed for a kettle, providing an overall carbon emissions reduction of around 10%.

We've also installed sensors in our washroom taps to avoid excessive water use, saving energy used to heat it.

Investing in efficient office equipment

With small power occupying around 15-20% of our energy consumption in 2007, we made a concerted effort to adopt energy-saving solutions wherever possible and collaborated with our procurement team to include energy efficiency as a buying criteria for new products.

For instance, we replaced our servers, laptops and other IT equipment with more energy-efficient models, and changed our hand dryers to air-blades which reduce drying time and energy consumption by up to 80%.

We've also consolidated equipment, introducing multifunctional devices (MFDs) and eliminating the need for separate printers, copiers and scanners. The MFDs not only save space but are more energy-efficient, switching to standby when not in use. Typically this creates energy savings of between 20-60%, if it replaces one that is run during the whole working day or 24 hours a day, respectively.

Most recently in our London offices, we have upgraded our kitchens, switching to fully electric appliances instead of gas. This, as well as the improved efficiency of the appliances installed, is expected to reduce energy use of the kitchens by at least 50%.

We are aiming to implement additional efficiency upgrades in future, with a focus on heating and cooling.

Energy Deep Dive: Where to start in your office?

It can be confusing to know where to start when looking to reduce energy and carbon emissions from your buildings, as measurement of your baseline can be challenging, and there are so many different actions you could take. Of course, starting with the most material impacts is best, even if this means using rough estimates of consumption levels or the associated greenhouse gases for your particular business. But how much might you expect to cut out, even once you've got a rough idea of your baseline?

Over the fifteen years that we've been acting on our carbon, we've got a feel for the reductions that can be delivered by specific actions. Whilst these are only indicative, they do give a sense of the magnitude of savings possible, and may help to create some rough and ready business cases. To that end, we've set out (see Chart 5) a broad set of actions and the range of benefits that each might deliver, as a starting point. You can then work with environmental and building engineers to get more accurate costings and a feasibility analysis for your specific situation.

As you will see, there are lots of choices, and some are relatively easy switches. It's also worth keeping an eye on the marketplace, as there are an increasing amount of low-carbon technologies and energy-efficiency solutions available, as carbon reduction becomes a mainstream business issue.

Chart 5

Portfolio of possible actions to reduce energy consumption within an office environment

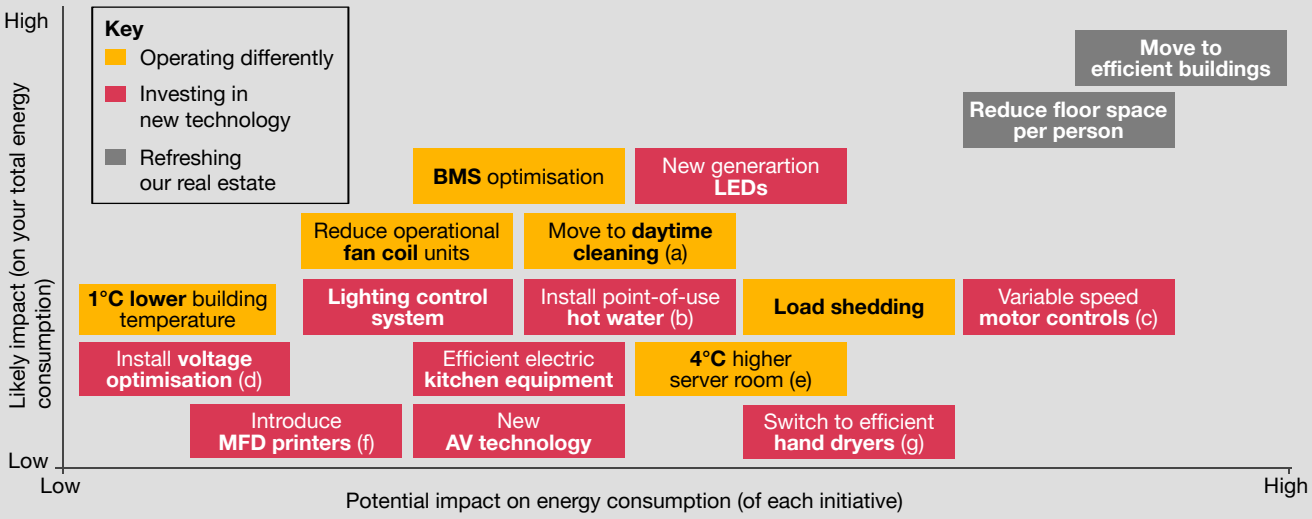


Chart 5 footnotes

a. Cleaning and maintaining office space during working hours instead of cleaning after office closure.
b. Instant hot water for hand washing compared to a centralised hot water tank.
c. Run electric motors at their required rate rather than their full capacity.
d. Lower voltage of grid electricity without impacting equipment performance. Applies to older buildings only.
e. Reduce AC usage in server room by increasing set point from 18-22°C.
f. Multifunctional devices (MFDs) compared to desktop printers.
g. Compared to conventional hand dryers.

Working with landlords

PwC UK has a portfolio of buildings across the UK, some of which are fully controlled by us, and some that are landlord-controlled, particularly in cities where we have smaller numbers of employees and may only need a floor or two, sharing the building with other companies. In landlord-controlled offices, there are different levels of influence: sometimes we control our area whilst the landlord controls the central plant, and sometimes the landlord oversees all the equipment including the fit-out in PwC zones.

Building arrangements where you have little or no control make carbon footprint reductions more challenging, but not impossible. Of course, we started with those buildings where we had full control – as it was easier to make a step change without having to get the landlord's and other tenants' approval, or to apportion any costs associated with it. Nevertheless, there are things you can do to reduce your carbon footprint even when you occupy multi-tenanted, leased buildings which are controlled by the landlord.

Take a long term approach

The time when you have the most influence over landlords is when you are negotiating or renegotiating a tenancy contract. Make a note of the date of any move or renewal and start early in the process, engaging them around your expectations for minimum environmental standards, making it part of the criteria for the deal. If we don't voice our desire as clients, landlords will never deliver lower carbon buildings. In some cases, you can also share your knowledge to drive new standards for all the occupants – as we have done regionally in some of our multi-tenanted buildings.

Isolate your part of the building

Asking the landlord for meter readings for your area, or fitting your own automated meters to your part of the building allows you to measure your performance accurately, helping you to spot ways to reduce energy consumption through operational changes. The key here is to negotiate a company-specific energy or electricity agreement, so that you are only paying for the energy you're consuming and your business benefits from cost reductions as a result of your actions. It's also important to get clarity about who is responsible for - and has permission for - maintenance, so that equipment can be fixed quickly to optimise consumption.

Energy reduction initiatives need to be those with shorter payback periods and which are possible to do in your sphere of influence – such as consolidating floor space or making changes in your area (e.g. reducing the temperature, moving to daytime cleaning (so you can turn off lighting and heating earlier each day), installing multifunctional devices, upgrading your lighting, or installing point-of-use hot-water (see Chart 5 on page 26).

Of course, you can always move to more efficient buildings, if landlords are uncooperative and you are not satisfied with the environmental improvements, when the lease comes up for renewal.

Take account of communal consumption

In multi-tenanted offices, the landlord can control a number of central services which you should take into account. This includes communal lifts, restaurants and other common areas. If landlords are unable to provide you with your share of this consumption, then uplifting your own supply based on the type of communal services is a valid approach.

Future opportunities

Landlords are becoming more approachable, with some now looking to push for energy saving technologies within their buildings, in line with the rise in energy costs and increased demand for more efficient buildings. However, challenges remain, including encouraging them to replace natural gas with biogas alternatives, which has cost implications.

We are working to encourage our landlords to share more data (e.g. the energy consumption of the entire building), which could be used for analytical purposes to identify opportunities to improve efficiency.

3

Taking Action:
Travel

Making moves on carbon

Decoupling our travel footprint from business growth

Business travel is a significant contributor to our carbon emissions. Fifteen years ago it made up 67% of our total carbon footprint. By 2019 it was up to 94%, partly due to changes in carbon accounting but mostly because we drastically reduced our energy consumption over the same period. Covid-19 all but stopped business travel over a two year period, and enabled us to challenge the way we operate, helping reduce associated emissions to 87% of our total carbon footprint in 2022.

Challenging ourselves on the need for, the frequency of and the mode of travel has been a central part of our approach to reducing our carbon footprint. So in 2012, we set ourselves a target to hold our business travel carbon flat by 2017 (against our 2007 baseline), whilst growing the business 50%. Following this, we set a further target in 2017 to reduce our travel emissions intensity by a third by 2022. This was achieved, alongside setting our Net Zero commitment in 2020 (see What's next: supporting the transition to net zero) to halve business travel emissions by 2030 against a new 2019 baseline.

Air travel was by far and away the largest component of our travel carbon, comprising both non client-facing and client-facing flights. The non client-facing element is an area where we've made great progress over the fifteen years by limiting flights, encouraging alternatives to travel and promoting low-carbon travel: from a baseline where internal flights comprised just under half of our total air travel carbon footprint back in 2007, we've managed to cut the carbon from these flights by 92% so that it now only makes up 14% of our total footprint from flights. Reducing the client-facing elements is more challenging. It's a complex issue as travel is important for building relationships which is at the core of our brand, and it's also important in the delivery of our increasingly global services.

Although not part of our business travel carbon, we have an eye on our commuting carbon footprint as part of our overall travel strategy. In 2022, we began reporting modelled commuting emissions alongside working from home emissions within our Annual Report. However, there is still work to do to improve the reliability of this data and the actionable insights that it gives us (see Hybrid Working section for full details).

To improve sustainable commuting options, our offices are located close to public transport hubs, and we provide rail season ticket loans. We also offer the options to salary sacrifice hybrid and electric vehicles through our car scheme (see information below), and bicycles under the Cycle to Work scheme.

Promoting online meetings, firm-wide

The simplest way to cut our travel carbon is, where feasible, to use technology to connect with clients and colleagues. Online meetings are one of several collaborative technologies that we've invested in and promoted to our people. But the systems have to be easy to use and available wherever people work, to enable adoption.

So, in 2017 we installed online meeting software on all laptops and mobile phones, set up video-conferencing facilities in all of our UK offices, and invested in software and training to pioneer collaborative working (for example, digital whiteboards, virtual dashboards, and remote collaboration on reports and documents). This meant that everyone - whether client-facing or in the back office - had access to tools for collaborative working without the need to travel so much. We then continued to evolve our online meeting software and infrastructure as technology advanced. See section 'Green tech: understanding and improving our digital carbon footprint' for more information.

As with many other businesses, the Covid-19 lockdown meant the entire business world had to quickly adapt to meeting remotely. These rapid changes helped strengthen our people's existing use of and confidence in online meetings and helped both our staff and clients realise the benefits that remote working can bring (for example time savings resulting in increased wellbeing). We've looked to maintain these new working practices post Covid-19, helping us further decouple our travel carbon from our business growth.

Adopting stringent approvals for flights

The biggest change we've made has been to introduce a travel policy and approval process, challenging our people's need to travel and the mode of transport they use, in particular when not servicing clients.

In 2009, we introduced a strict approval process, requiring all of our people to gain senior management sign-off before taking any non client-facing flights. Whilst an approval process doesn't prevent flying, it does help challenge people to think about whether they really need to travel, and was extremely effective in reducing trips almost immediately.

The other helpful lever to reduce carbon emissions, is a strong policy around class of travel. We have a grade and distance based policy, restricting the level of class our people can use, reducing both the climate impact and cost of our travel. This is true for all trips - client and non client-facing.

The process and policy have been refined and reinforced on a regular basis using data-driven decisions, to ensure they are still front of mind and being applied across the business, coupling it with the availability of online meeting tools as an alternative.

Encouraging low-carbon alternatives

With rail being a low-carbon travel option, we took several steps to encourage our people to travel by train where possible. First, we've chosen to locate many of our offices at or near large rail hubs (e.g. Charing Cross, London Bridge, Birmingham New Street, etc.). This makes it easier for people to reach us by public transport on their commute and for us to travel out to clients by train, too.

We've also made it pleasant for people to opt for trains when on business trips. We allow managers and above to travel first class within the UK on journeys over an hour if there is a business need, and Business Premier class on the Eurostar, to reduce domestic and short-haul flights.

We offer all permanent employees the option to apply for an interest-free season rail ticket loan facility, allowing them to pay for the ticket in monthly instalments rather than as a large annual sum. We also participated in the government's 'Cycle to Work' scheme for several years enabling us to lend bikes and cycling safety equipment to our people as a tax-free benefit. The scheme had 240 participants in 2022, bringing the total close to 3,000 since we began.

Towards low carbon cars

Whilst developing our offices, we've deliberately chosen not to provide parking facilities, to discourage the use of cars. (Where we have installed a limited number of parking bays, these are dedicated to disabled access — to support social inclusion — and have charging points to encourage the adoption of electric vehicles). We also know that travelling by road is sometimes necessary. So if our people have to travel by car, we've been working to encourage them to consider the most sustainable way to drive. This includes providing information on choosing fuel-efficient and low-carbon cars, driving efficiently and car-sharing.

In 2020 we launched a pilot to learn how electric vehicles could help us reduce our carbon footprint. The cars were used by our people to replace taxi rides to get to locations that might be more difficult by public transport, and were aimed at reducing our carbon emissions and costs. The trial ran for three years in both London and Birmingham (our then-largest office outside the capital) and helped inform our decision to include electric cars within our car lease scheme.

As regulation and innovation have driven improvements in the carbon footprint of cars available in the marketplace, we've refreshed our car lease scheme interface so that environmental issues are front of mind when our people are choosing a vehicle. On the home page, for instance, we've included a series of 'green' cars (hybrid and electric) as 'hot picks'. This has helped to reduce our business travel carbon footprint: between 2007 and 2022, the average carbon per kilometre of our employee car fleet has dropped from 140 g/ km to 105 g/km, a reduction of 25%. A recent push to promote EV uptake in our car scheme, means over 80% of our current order book are now electric vehicles and not a single diesel vehicle was purchased in 2022 using the scheme.

Next Steps

We are a people business and so building and maintaining relationships and working alongside our clients and each other, wherever we may be, is key to our delivery of quality services. This means that business travel will remain a necessary part of the way we work. To proactively manage the return of travel following Covid-19, we're taking a strategic and data-driven approach. We've established a comprehensive 'Thoughtful Travel' programme, which helps us to challenge ourselves on how we deliver our services to clients and how we work together, helping business travellers make better informed travel decisions. We are investing in a new Net Zero Travel Dashboard as the first step in finding data informed solutions. Dedicated 'Thoughtful Travel Leads' from across the business are using this to explore opportunities for carbon reductions relevant to their area of business. This is helping them stay within their specific 'carbon cap' for the year.

We have also developed a carbon emissions calculator to estimate and then report project based footprints associated with our client work. This tool allows us to forecast the engagement emissions, and then calculate potential carbon reductions possible through streamlining travel to and from a client site. Through the pilot process, we learnt that certain types of meetings are easier to do remotely than others, such as regular status updates. This has also enabled a pathway to provide clients with engagement specific carbon emissions to support both their own scope 3 reporting and the delivery of their net zero targets. In future, we will look to embed the use of the calculator more broadly.

Whilst our most material travel impact is carbon emissions from flights, we are also looking across all areas of transport. For example, we're removing the ability for our employees to lease diesel vehicles from 2025, and are reviewing how we further support and encourage our people to switch to electric vehicles at home too.

4

Taking Action:
Other focus areas

In addition to energy and travel management, we've put in place several other initiatives which have helped to reduce our total operational carbon emissions.

Material consumption

Our work on material consumption and waste is summarised in our 'Going circular: Our 10 year journey' publication, which outlines our journey to apply circular thinking to our operations and procurement, exploring fully circular solutions which alleviate pressure on materials, water and the climate.

One of our main priorities in material terms has been the paper we use in our offices and we've run a number of initiatives over the years which have helped us drastically reduce this. In fact, in 2022, our paper consumption was 93% less than in 2007, which we estimate has saved us £7.8m in cumulative costs.

We largely achieved this by removing all the desktop printers and replacing them with multifunctional devices that have default double-sided printing, as well as transitioning to more digital ways of working, including signing and storing legal documents electronically. Moreover, we've reduced both our carbon footprint and material-related impacts by procuring recycled paper. Achieving the top rating in the WWF Environmental Paper Company Index, our office paper now comes from a state-of-the-art facility which takes our confidential paper waste and can recycle it twenty times – three times more than traditional paper recycling.

We've also made several changes to reduce water consumption in our buildings, such as installing waterless urinals and better condenser water systems across our real estate. Since 2007, we've cut consumption by 61%.

In 2022, we began modelling the emissions related to all of our purchased goods and services based on procurement spend data, which includes material consumption and water (see 'Supply chain' section below). Therefore, we no longer report on material consumption emissions separately. Despite this, we still maintain our efforts to minimise our impact in this area.

Waste

We've measured the carbon footprint of our waste since 2010, when the UK government (Defra at the time) first provided guidance on it. We estimate that, at that time, it accounted for 7% of our total carbon footprint. Having considerably reduced the amount of waste we produce and having achieved 'zero waste to landfill' since 2012, our focus for the past ten years has been on working towards 100% reuse or recycling, shifting away from incineration (see www.pwc.co.uk/goingcircular).

In 2022, we sent 90% of our practice floor waste to reuse or recycling, and had reduced our waste volume by 82%, achieving our -75% target. These changes, together with revisions in the carbon conversion factors published by the UK government, mean that at the time of publishing, waste represents only 0.08% of our total carbon footprint.

Carbon neutral

We've offset all our greenhouse gas emissions as reported at the end of each year since 2007 to achieve carbon neutrality, buying carbon credits that are certified under recognised standards (REDD+, CCB and VCS), via an ICROA registered broker. This ensures that our carbon credits are real, measurable, addi8tional, permanent, independently verified, unique and traceable, with a transparent chain of custody, from issuance through to retirement - and that we are doing everything we can to act on carbon.

These projects support other sustainable development outcomes - for instance protecting the health and livelihoods of people living in rural communities, as well as protecting the critical ecosystems that support them. Recognising the importance of biodiversity and ecosystem services, the projects we currently support are focused on forests in recognised biodiversity hotspots, meeting the Climate, Community & Biodiversity (Gold) standard in addition to REDD+ mentioned above. They form part of the portfolio of projects supported by the global PwC Network, through which we have also joined the LEAF Coalition (Lowering Emissions by Accelerating Forest finance). LEAF is a public-private initiative that aims to protect tropical forests at scale, through a long term commitment to purchasing high integrity carbon credits that are verified against the independent and rigorous ART/TREES standard. It is expected to become one of the largest ever public-private efforts to protect tropical forests and will form the basis of our offsetting strategy for the years ahead. In parallel, we're investigating natural climate solutions as part of our global net zero commitment with a view to removing our remaining carbon emissions by 2030.

Supply chain

Businesses are increasingly being encouraged to account for and drive down their impacts beyond their direct operations, which includes the goods and services they procure. As a professional services firm we purchase fewer materials than businesses in many other sectors. However, we spend around £700m with suppliers each year so we strive to influence our sustainability impacts beyond our direct operations where we can.

To tackle these impacts, we have a long standing supply chain sustainability programme to engage and upskill our key suppliers on our sustainability priorities, and embed them throughout the procurement life cycle. We also have targets for supplier decarbonisation and report against them in our Annual Report. We engage with suppliers in various ways, including through our annual supplier sustainability forum, 1:1 outreach, and third party sustainability assessments.

To scale our impact, in 2022 we also developed a free, year-long SME support programme for our suppliers. This specifically targeted the two hurdles raised by our suppliers: lack of capacity (lack of resources to dedicate to this space) and capability (lack of specialist knowledge and expertise in-house).

The programme supported our suppliers to kick start or accelerate their decarbonisation journey, and eventually set their carbon reduction targets aligned with the SBTi. It included a training course (this provided suppliers with a clear overview of how to approach a Net Zero strategy, decarbonisation planning, and so on); a carbon footprinting software that guided suppliers through developing their Greenhouse Gas (GHG) emissions inventory and emissions calculation; and other practical guidance to target specific challenges. The programme was offered to over 100 of our suppliers, and received strong uptake and positive feedback from participants.

Managing our waste has a positive societal carbon impact, even though it's a small part of PwC's operational carbon footprint.

Deep Dive: Embracing hybrid working

Taking accountability

Hybrid working has transformed the way in which the firm utilises our office spaces. The term 'living portfolio' aligns to the firm's hybrid working environment and is a phrase often used which refers to the continual evolution of our workspaces and services. One of the responsibilities of our internal infrastructure team is to develop briefs which are robust in achieving minimal change in the short term whilst giving PwC flexibility in the long term. Most recently, we've been reimagining our office spaces, as detailed in the 'Energy: Consolidating our office space' section. These trials allow us to test out changing work settings based on the evolving needs of our people.

As early adopters of hybrid working, we were well positioned to adapt to full remote working when Covid-19 hit. However, we were also aware that while some areas of our impact were reduced, with fewer people commuting, travelling and using our offices, the shift to remote working introduced a new source of emissions attributable to PwC; working from home.

These emissions are not included in our Net Zero targets, as emissions from both of these are deemed outside our operational control. Yet, with commuting emissions becoming a mandatory reporting requirement for PwC through the Cabinet Office's Carbon Reduction Plan requirements, and with its interrelation with working from home emissions (both falling under the 'commuting' category in the GHG protocol), taking accountability for both categories was a natural next step in improving the completeness and transparency of our reporting. Please see the 'Travel' section for full details on the actions taken specifically to address carbon from commuting.

Emissions calculation

There was an initial lack of standardised guidance available for calculating both commuting and working from home emissions. However, there are now a number of open source tools and methodologies available to use following a growing demand since the pandemic.

For commuting, we started by following the GHG protocol guidance on calculating commuting emissions (Chapter 7). Without actual data available, this required us to develop a methodology using the 'average-data method'. The final figure was calculated by estimating an average commuting carbon figure for an employee, working out on average how many days an employee would commute in a year, and then multiplying this by the average number of employees, factoring in part time reductions. The average commuting carbon was calculated using government published data which provided estimated commute journey length and transport mode split per region of the UK.

To create our home working model, we built on an openly available 'Homeworking emissions whitepaper' which has since been adopted into the UK government's greenhouse gas conversion factors and is commonly referenced by businesses reporting these emissions. In line with the recommendations, our method calculates emissions associated with our people's heating, lighting and powered electrical equipment, as these were identified as the most significant impacts while working from home.

As the whitepaper recommends, we have refined the methodology to allow the incorporation of PwC specific data over time (e.g. from internal records, surveys and asset lists), replacing assumptions. This enables us to monitor improvement, which will be influenced by programmes we are delivering.

Green tech: understanding and improving our digital carbon footprint

With our increasing reliance on technologies and online communications, in particular after Covid-19, we've expanded our sustainability agenda to focus on our digital footprint. Our aim is to better understand the associated environmental impact of our technology usage, and to explore how we can use it in the most effective and responsible ways.

We have transitioned away from the majority of our on-premise data centres to cloud-based hosting, which provides a significantly higher utilisation rate, and in turn improves efficiency and reduces electricity usage. We have also moved from self-hosted software to Software as a Service (SaaS) platforms to host technology solutions developed for our clients or internal purposes.

In 2022, we performed an in-depth technology carbon impact assessment across various aspects of technologies that our people use to enable flexible working, including hardwares, hosting platforms, SaaS and communications tools. The main objective was to understand our digital footprint, provide insights on how to manage the impact, as well as recommendations on how to reduce those emissions through our operations, supply chain, people and clients. Following the assessment, we also published a lessons learnt report sharing our approaches and key findings.

In the same year, we upgraded our meeting room technology, which has reduced energy usage by 49%, partly due to the fact that monitors will automatically turn off when not in use. We are also phasing out a number of unused printers, which have the largest single unit embodied emissions by far, and replacing them with flexible working spaces for employees. Laptops were identified to have the largest total emissions among all of the hardware we use, due to the large volume that we procure. We are therefore exploring options to extend their lifetime, as well as replacing old laptops with models that could improve energy efficiency by over 30%.

While making changes and improvements to our hardware, we were also keen to minimise any unnecessary waste during the refreshment process. Therefore, we ensured all retired meeting room systems were recycled or repurposed. We also worked with system providers to reduce transport-related emissions associated with delivery and installation, by requesting direct deliveries without going through a distribution centre, and having the installation engineers use public transport. We are considering adopting a similar delivery model for our other IT hardware, where possible.

In the coming year, we aim to better understand the life cycle analyses of hardware products, to allow us to compare and make more informed purchasing decisions across different models and providers of the same product - particularly laptops and monitors, which will continue to make the biggest impact due to the large quantity of these that we own.

Taking people on the journey

Doing the right thing for the environment matters to our people, and they have high expectations of us. To ensure that they feel proud of our sustainability story and are keen to play their part, we must show that we are meeting our targets and taking action, as well as providing opportunities to get involved in firmwide initiatives.

There are lots of stakeholders who have a part to play in any carbon emissions reduction programme, including business leaders, suppliers, landlords and employees.

Building an understanding

Throughout the last fifteen years, we've raised the profile of climate change to our people in as many appropriate channels and initiatives as possible via our sustainable lifestyles programme. But with thousands of new graduates joining each year, maintaining this awareness and pride requires us to continually invest in re-education and sustainability engagement. Embedding training into our graduate scheme and onboarding materials has ensured that all employees are empowered from the start.

Over the years we have regularly highlighted the relevance of taking action on carbon as part of our permission-based sustainability newsletter, as well as in our firm-wide communications about our new buildings, through our annual sustainability performance reporting and our environmental volunteering programme.

We have also developed and offered sustainability training to all our people over the past fifteen years, more recently providing access to our ESG Academy, which includes both broad climate science upskilling training modules, as well as detailed role and industry specific training courses.

Supporting our people to act on carbon

In addition to upskilling our people and encouraging sustainable business travel behaviours (see Travel section), we also create opportunities for them to embed sustainability considerations at home, and provide practical support for reducing their own personal environmental impact. We do this through our longstanding 'sustainable lifestyles' programme, available to all staff.

For example, to encourage the use of more sustainable transport modes for commuting or personal travel, we have run Q&A webinars with expert guest speakers to discuss the practicalities of sustainable transport (i.e. charging station advice for electric vehicles).

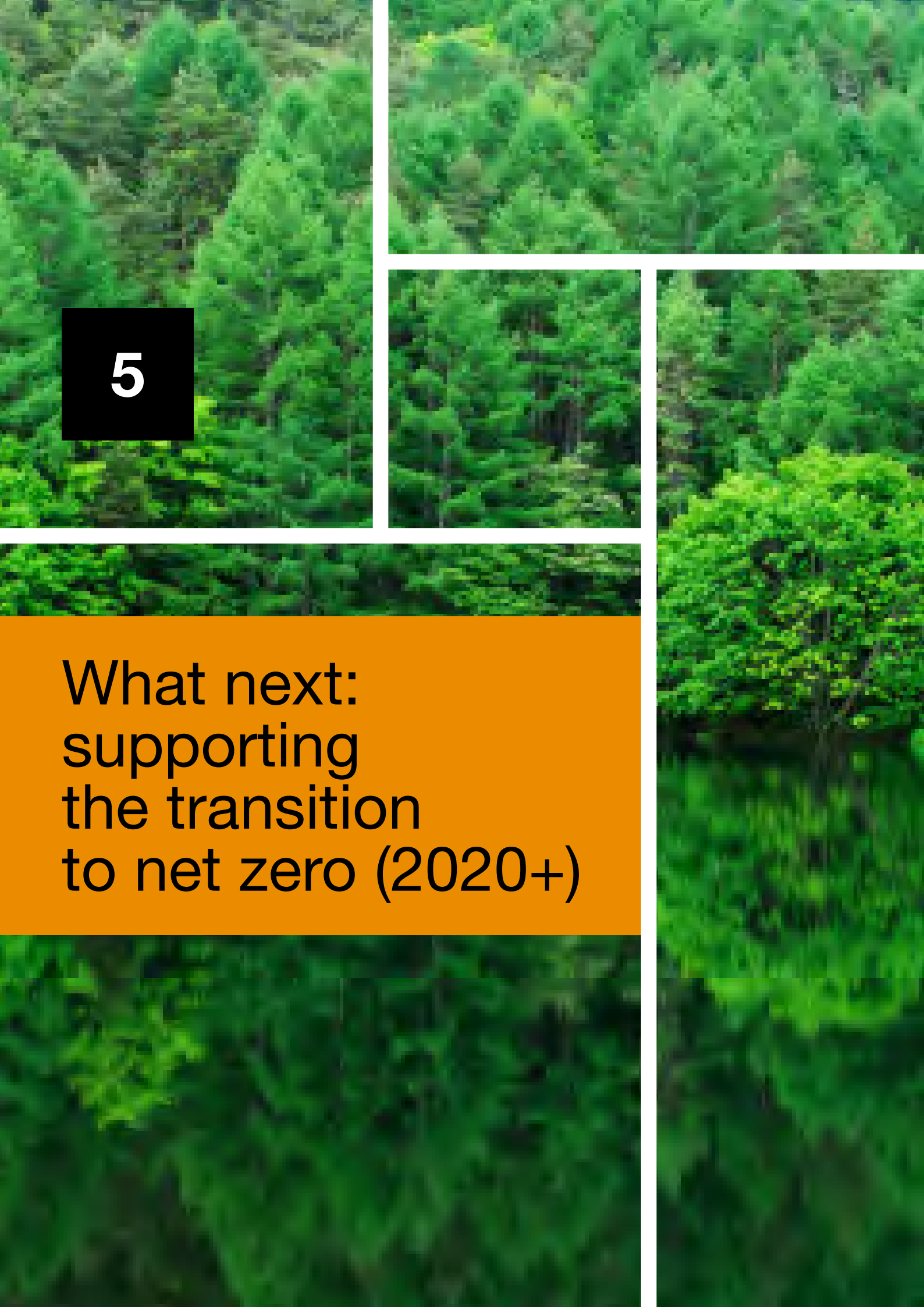
Food choice has one of the largest impacts on personal carbon footprints, so since 2017 we have been working with our caterers to reduce the carbon footprint of the food we serve in our office restaurants, whilst using behavioural nudges to encourage more low-carbon healthy choices (i.e. menu positioning). We also run an annual Veganuary Workplace Challenge — the first large corporation to do so — helping our people to explore plant-based food options and connect with others to share new recipes and ideas. We use promotional offers, competitions and guest speakers to highlight the connection between food and carbon, with fantastic engagement scores (see case study here).

In 2020, in response to the COVID-19 lockdowns, we developed a 'Sustainable Living at Home Guide' to help our people to make informed choices in relation to sustainability, whilst we were unable to continue our regular in-person engagement. During the launch, over 5,000 people viewed it and we have continued to evolve this 'living library' ever since. It is packed with an array of resources and advice on energy saving, sustainable eating and minimising food waste, embracing a plastic free lifestyle and resources for personal offsetting.

Ahead of COP26, we also partnered with Count Us In to empower staff to take positive action through a series of personal pledges, many of which align with our existing programmes. This global initiative aims to inspire a billion people to significantly reduce their carbon footprint whilst challenging leaders to set and deliver bold climate commitments. In 2022 we hit a milestone as more than 2,000 of our people took almost six thousand pledges, collectively promising to save more than a thousand tonnes of CO_2.

People power

Whilst it can be hard to tease out the relative contribution of each action to our overall carbon result, together, these initiatives have increased climate change awareness amongst our people, and led to a greater desire for them to take action - overall resulting in more instances of positive behaviour change. We also know that sustainable lifestyle choices can deliver a number of other wellbeing benefits, for example through active travel.



5

What next: supporting the transition to net zero (2020+)

Since the Paris Agreement and the launch of the SDGs in 2015, the role businesses play in limiting the impacts of climate change has taken centre stage, with a step change in the number of companies making bold commitments to decarbonise their operations. We're already on the front foot, having made great progress in reducing our carbon emissions over the last fifteen years. We now operate from a dramatically leaner and more energy-efficient set of offices, with robust practices in place to track and improve our performance.

However, climate science highlights the urgency for us to go further, faster. At PwC, we believe the business community has a key role to play in the transition to a net zero economy by 2050, in order to avoid the worst impacts of climate change.

Hence, in 2020 PwC made a worldwide commitment to become Net Zero, with 2030 goals, joining the United Nations Race to Zero campaign and Business Ambition for 1.5°C, bringing business together to accelerate action to decarbonise the economy. This involved a market scan to understand the uptake of science based targets and net zero ambitions, followed by setting our own near term Science Based Targets (validated by the Science Based Targets Initiative (SBTi).

For the UK, this meant setting a new baseline to 2019, and aiming to halve our operational footprint again, within the next decade. It also requires us to double our efforts in decarbonising our supply chain, and use our skills and knowledge to help clients and the market transition towards a net zero economy. Finally, we will continue to both procure 100% renewable electricity, and offset 100% of emissions within our Net Zero scope through high quality carbon offset programmes, transitioning to removals from 2030.

Alongside our 2022 targets, we began reporting against our Net Zero ambition in our Annual Report in 2021, and continue to monitor our progress closely while shaping our net zero strategy, to ensure we are doing everything we can to act on carbon.

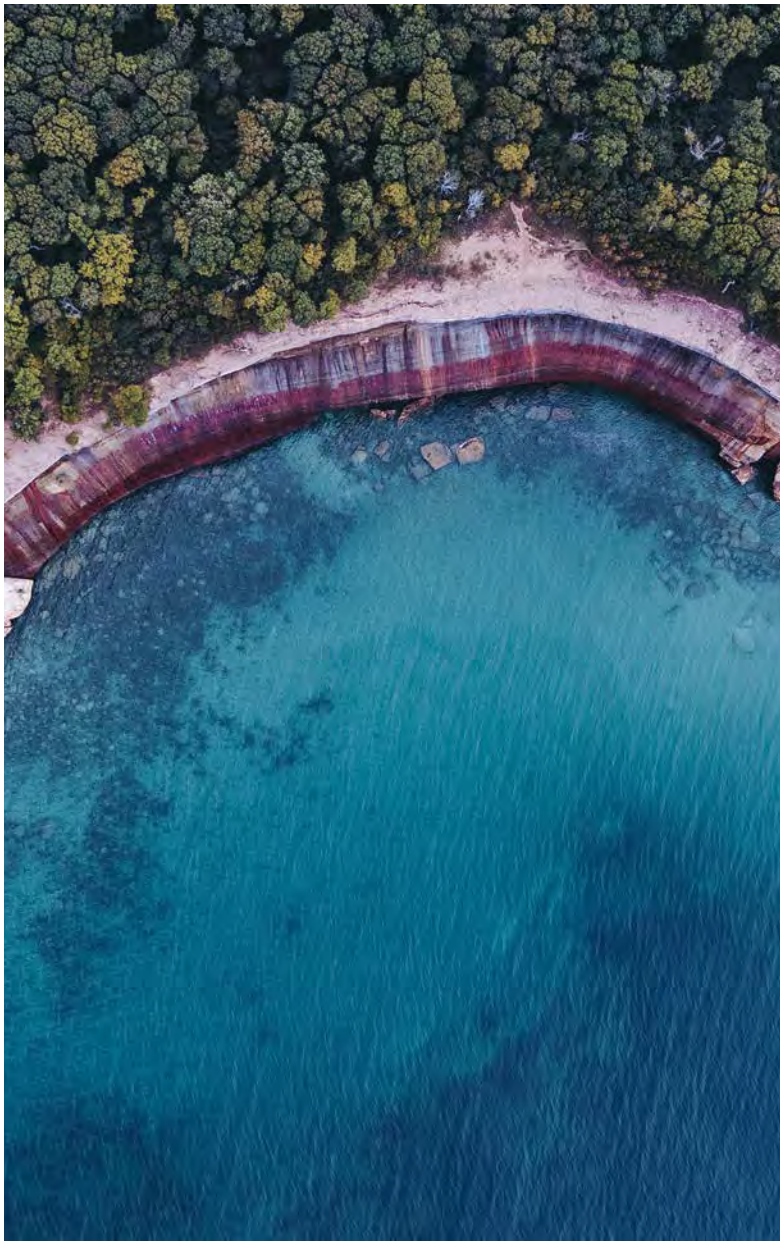
We will also be:

- embedding the implications of climate change and other Environmental, Social and Governance (ESG) related factors across the work we do with clients, from strategy to implementation.
- continuing to advance corporate reporting standards that champion comprehensive non-financial reporting practices.
- maintaining our long-standing programme of research and collaboration with businesses, policy makers and non-governmental organisations to accelerate the transition to a net zero economy.

Table 3

Our Net Zero targets (2019 to 2030)

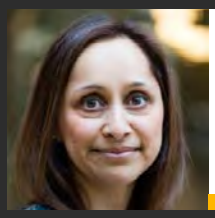
Operational carbon	We'll reduce our scope 1 and 2 emissions by 50% by 2030
Business travel	We'll also reduce our scope 3 business travel (i.e. land-based travel, air travel and accommodation) greenhouse gas emissions by 50% by 2030
Electricity	We'll continue to procure 100% renewable electricity
Offsets and removals	Maintaining our carbon neutrality for those emissions we have control over, and investing in carbon removal projects from 2030 to compensate for all remaining emissions
Suppliers	Ensuring that 50% of our suppliers (by emissions) have set their own science-based target by 2025



Want more details?

For information on our low carbon economy work for clients, please visit www.pwc.co.uk/services/sustainability-climate-change

For more on our overall corporate sustainability agenda, visit www.pwc.co.uk/corporatesustainability



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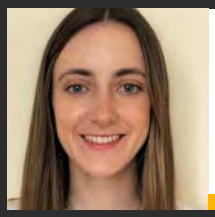

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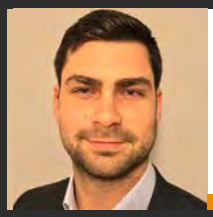

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