

ISSUE 7 AUTUMN 2021 HOARELEA.COM

**COP26**  
SPECIAL EDITION

The future belongs to the curious.

# Exploare

A magazine from Hoare Lea







The future belongs to the curious.

**“The beautiful... something you know added to something you see, in a whole that is different from the sum of its parts.”**

Norman Fitzroy Maclean, 1902 - 1990, author and scholar



Places.

People.

**Fresh perspectives / 6**  
Robert Winch on climate-led investment risk and opportunity  
**Lucy Yu / 10**  
Data-driven climate action  
**Two sides of the same coin / 30**  
The finance and property worlds come together to talk...

**Whipp's Cross / 8**  
Informing the NHS's New Hospital Programme with Net Zero innovation  
**Timber Square / 14**  
A ground-breaking Design for Performance office development  
**Bristol City Council / 28**  
Creating a carbon neutral city by 2030  
**Rhiw Cefn Gwlad, Bridgend / 36**  
Wales' first energy-positive housing development

**Trend report / 4**  
Net Zero numbers and latest news  
**The way the wind blows / 16**  
What will the next decade hold for the ever-evolving reality of sustainability?  
**The right route / 38**  
Leading the UKGBC's Whole Life Carbon Roadmap and beyond

Possibilities.

FOREWORD

Evolving the built environment puts us at a unique intersection. We span technology, economics, local and global regulation, environmentalism, and the health and wellbeing of society. We craft the stage where lives – billions of them – play out every day.

The privilege, magnitude, complexity, and responsibility of this role can sometimes feel daunting. With every innovation, every development in how we work, and each impactful project, the need for more, better, newer seems to follow. The world feels fast, vast, and often out of control. Despite the pioneering developments they may feature, when projects take years to come to fruition, it can feel as though there's always more that could be done.

So how do we combat that overwhelming feeling? How do we even begin to make changes that keep pace?

## We explore.

The climate emergency has pushed us all to ask who we are, why we exist. When it comes to businesses, the questions are sometimes uncomfortable – and finding answers that ring true isn't always easy. Do we still bend to the will of the status quo too easily sometimes? Are we all actually working *together* to create a legacy that protects our planet and that we can be proud of?

**Doing things differently can be difficult. But it's an ability that lies deep within us all.**

We know we have to respond and adapt in a manner that mirrors that scale of the challenge. Every business needs a vision of what we can do – in our own small way – to enhance society and improve the world. Our industry has so much to contribute to the curation of a better future. But purely looking at climate constraints us... the planet is populated; we are inseparable from our natural world. There is not one person on this earth who isn't at the mercy of human emotions, human problems, human desires. The briefs for the best buildings now begin with *both* the question of how they will protect our planet, and how they will help people.

So let's give ourselves permission to lead the way together, to know what we collectively stand for, and to be brave in our ambitions. After all, it's a small ask for a very big return...

# The trend report.

## The Net Zero numbers: offices.

A FEASIBILITY STUDY INTO THE DESIGN, DELIVERY AND COST OF NEW NET ZERO CARBON BUILDINGS

**WHO?** Developed by Hoare Lea, as Partners to UKGBC's Advancing Net Zero programme.

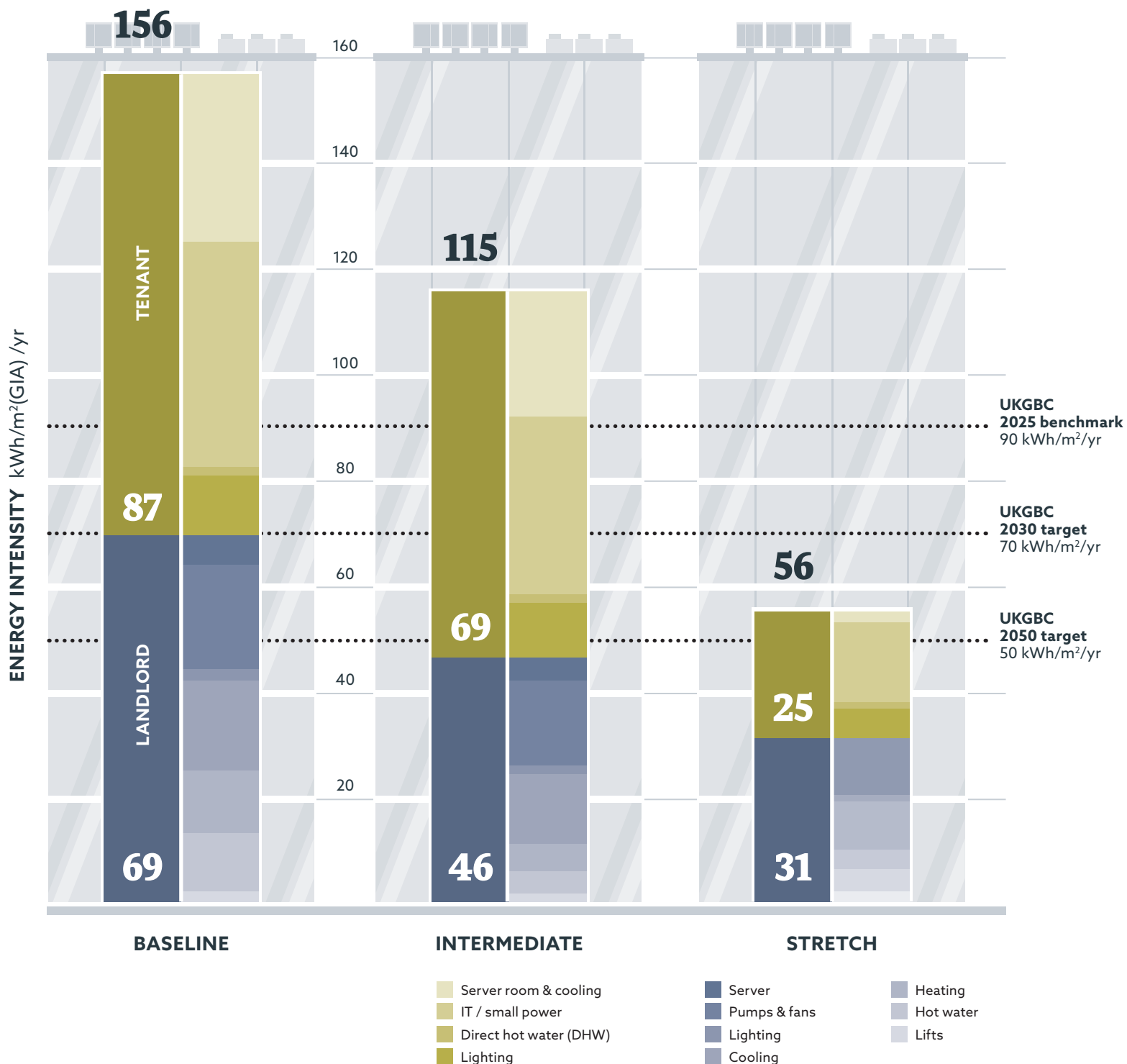
**WHY?** Establish the real-world cost implications for achieving new Net Zero buildings to improve the industry's collective understanding.

**WHAT?** The commercial office calculations

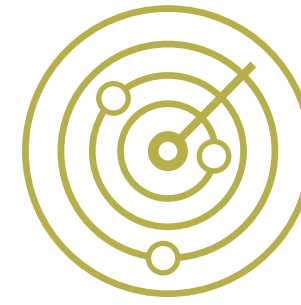
**Baseline** The baseline design represents current standard practice in high-rise office buildings, and is modelled on a new 16-storey BCO Grade-A city building, with a steel frame structure.

**Intermediate** The intermediate design features a hybrid steel-frame and CLT deck. The façade design more significantly incorporates orientation, glazing and facade considerations, among others.

**Stretch** The stretch scenario changes to a full timber structure and features mixed-mode ventilation. Glazing ratios are reduced but remain double rather than triple.



## On the radar.



### 1.

#### PARIS-PROOF TARGETS

Energy Use Intensity (EUI) is growing in awareness, due to the need to reduce the reliance on green electricity as a sole method of reaching net zero carbon. 'Paris-proof' EUI for a building typically means an average of a 60% reduction in energy use. [Let's talk - EimearMoloney@hoarelea.com](#)

### 2.

#### GOV INVESTMENT IN LOW ENERGY HOMES

BBC News reported on the Welsh Government committing to 20,000 new low-carbon social homes for rent by 2026. The piece cited Rhw Cefn Gwlad, the net-positive social housing scheme in Bridgend, as an example of success. [Read more - bbc.co.uk/news/uk-wales-58078894](#)

### 3.

#### WHOLE LIFE ZERO CARBON FOR LATER LIVING

The UK's first net zero carbon scheme in the later living sector is being developed at West Byfleet, Surrey, and will be the first to use the UKGBC's Net Zero Carbon Buildings Framework Definition. [Let's talk - MarkWilkinson@hoarelea.com](#)

### 4.

#### LONDON'S COMMITMENT TO CHANGE

New London Architecture has announced its Net Zero programme panel comprised of experts from across London's built environment industry who will oversee a year-round programme of activity, research, and policy responses. [Let's talk -](#)

## Conversation kickstarter.

**“We all recognize the need to do more, work harder, share knowledge, collaborate, and find a way to reverse the climate tide. This is not a race worth running alone.”**

Will Bax, CEO, Retirement Villages Group

**“You cannot adapt to lost cultures, traditions, and history. You cannot adapt to starvation.”**

Vanessa Nakate, Founder of the Rise Up Movement, speaking at the Youth4Climate summit in Milan

Join the discussion at [hoarelea.com/insights](https://hoarelea.com/insights) Or listen via iTunes, by searching **Hoare Lea**

## Kaizen corner.



“Change for better: one-time or continuous, large or small.”

Great leadership requires a mix of skills to create the conditions for engagement, happiness and performance, and — in new research shared by *Forbes* — empathy tops the list.

## Hoare Lea is...



### Thinking about. Inclusive innovation.

A key aspect of catalysing and enabling research in practice is by promoting an inclusive and open culture of innovation and working collaboratively with other organisations. Our Applied Research and Innovation team's initial research areas are on climate change and resilience, nature-based solutions, biodiversity, circular economy and whole life carbon analysis. [Let's talk - SamWilkinson@hoarelea.com](mailto:SamWilkinson@hoarelea.com)



### Talking about. The digital opportunity.

As part of our firm's internal Digital Engineering Week, we explored the digital opportunity with a panel of industry experts. Together, we explored how insights provided by data will help steer the future of engineering and project delivery by working towards a construction industry that's efficient, human-centric and planet-positive. [Let's talk - TomCollins@hoarelea.com](mailto:TomCollins@hoarelea.com)



### Caring about. Our Net Zero Carbon journey.

As a firm, we have undertaken an assessment of our net zero carbon building strategy to ensure our offices are net zero carbon well in advance of our World Green Building Council pledge deadline of 2030. Publishing our carbon reporting on an annual basis will promote transparency and support our principles of open disclosure and continual improvement. [Read more - hoarelea.com](https://hoarelea.com)



PEOPLE

**Fresh perspectives**  
New voices of the built environment

Robert Winch, ESG Consultant

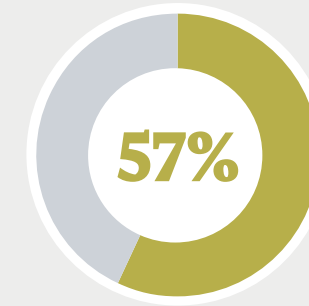
**Climate risk is investment risk. But nature has the answer.**



Global markets are at the start of a seismic shift. It's a shift that will see traditional 'minimal questions asked' capital rejected in favour of sustainable investing.



**Now**  
ESG funds as share of the European sector



**2025**  
ESG funds as share of the European sector

Research carried out by PwC estimates that ESG (Environmental, Social, and Governance) funds will increase from a 15% share of the European sector to 57% by 2025. This transition away from business-as-usual can, at least in part, be accounted for by three key factors:

**1. A growing recognition that ESG funds have fewer risks and generate greater returns.**

ESG scoring provides a granular view of assets and acts to filter out investments that carry higher environmental, social and governance risks. Investors are always looking to avoid real-estate assets becoming stranded and asset value depreciation, and today these risks include flooding, overheating, water scarcity, storms and cold snaps. ESG portfolios were also found to have greater resilience during the 2015-16 and 2018 market downturns.

**2. Regulators and governments are expanding their focus on ESG reporting.**

In the UK most business will be obligated to report on their physical and transitional climate-related risks using the Task Force on Climate-related Financial Disclosures (TCFDs) framework by 2025. This surge in data availability will enable investors to make more informed decisions about the investments they make.

**3. Financial decision-makers are seeking more sustainable solutions.**

Increasing disclosure and public awareness of sustainability is impacting investor allocation and demands are being made of companies to take action. BlackRock surveyed 425 investors in 27 countries representing \$25 trillion assets under management, finding 54% consider sustainable investing to be fundamental to investment process and outcomes.



**The natural world is our multifunctional solution to physical risk. It's been calling quietly to us for centuries, but now we're ready to listen.**

Yet the benefits of this move to an ESG-led investment landscape extend beyond the horizon of mere risk avoidance... and into that of opportunity. Financial returns, thanks to greater operational efficiency, better stock price performance and enhanced reputational and asset value, are sitting there for the taking.

So what does this mean for our buildings? The answer, unsurprisingly, is nature.

The natural world is our multifunctional solution to physical risk. It's been calling quietly to us for centuries, but now we're ready to listen. Our industry is waking up to nature-based solutions - their benefits in reducing energy consumption, improving air quality, creating social value, and supporting our mental and physical health. Nature-based solutions are structures like green walls, green roofs, parks and Sustainable urban Drainage Systems (SuDS). The financial value of these solutions? In the UK, it's estimated at £958 billion according to The Office for National Statistics. Defra also predicts the value to increase over time due to:

- demand for the benefits heightening
- the impacts of climate change intensifying
- the user base increasing through population growth
- nature becoming scarcer in abundance and distribution

The message is clear: nature-related risks can be overcome in the built environment by embedding nature-based solutions into real asset design. It's wonderfully and inspiringly simple. □

**LET'S TALK**  
RobertWinch@hoarelea.com



<b>Whipp's Cross Hospital.</b>	
The client	Barts Health NHS Trust
The architect	Ryder Architecture
The expertise	MEP, Acoustics, Net Zero Carbon, ICT, Sustainability, Vertical Transportation
The challenge	Regenerating the Whipp's Cross area into an integrated health, social care and health & wellbeing campus, that pioneers the latest Net Zero Carbon solutions and informs the NHS's New Hospital Programme.
The sector	Healthcare



Image courtesy of Ryder



## Lucy Yu. Putting people and real-world data at the heart of energy research.

From the highly competitive UK Civil Service graduate programme, to CEO of Centre for Net Zero, in just two decades Lucy Yu has gathered astounding insight into the ways the public and private sector can drive towards a better future. She talks to us about how she's channelling her expertise into tackling the climate crisis.

**Q** How has your varied career evolved over the years, Lucy?

**LY** I initially trained as a scientist at Imperial College so I learnt a lot about scientific rigour, critical thinking and research methodology. I soon realised that I wanted to be somewhere where I could directly see the real-world impact of my work and make a difference, so I applied for a role in Government. For my first placement, I was assigned to the office of the Chief Scientific Adviser at the Department for Transport right at the beginning of a wave of technology-driven transformation. It's a wave that's continued to the present day and ushered in innovations that the majority of us now take for granted in our daily lives: digital maps and payments; real-time transport information, journey planning and state-of-the-art retail logistics; ride-hailing and shared mobility; connected vehicles and driver assistance systems...the list goes on.

After several other posts over the next few years (including a couple of top secret clearance roles!), I was approached by an ex-colleague to join an early stage startup developing AI powered software for smartphones. I'd had an interest in startups ever since my university days (several of my lecturers had run their own spinout companies and I often found hearing about these to be more interesting than their actual lecture courses) and so the opportunity appealed to me. It was in the years before everybody had a smartphone and we could see a touchscreen interface was coming, presenting huge opportunities for software innovation. Ultimately the software we built ended up becoming the number one app worldwide for both Android and iOS and the company won countless global awards for innovation before selling to Microsoft.

During the years that followed I was involved in a variety of roles centred around the Internet of Things, autonomous vehicles, Agile software development, micromobility and even a brand new further education college focused on digital skills! Along the way I've ended up gathering an incredible entrepreneurial tech network and a vast network of global policy wonks and regulators. So, starting up Centre for Net Zero is really just a coming together of all of my experience, interests and networks, for a purpose I've felt strongly about since childhood. >>

# Data-driven climate action.

All photos courtesy of Lucy Yu



**It's going to take  
unprecedented  
cooperation to  
tackle the climate  
challenge.**





**Q** How do you see tech, government, and research coming together to tackle climate change, both in the UK and globally?

**LY** I've always had a keen interest in environmental and sustainability issues but it's clear that making serious inroads into the climate crisis isn't something that Government, research, or the tech sector can solve alone. It's going to take unprecedented cooperation to tackle the climate challenge. I think the Covid-19 pandemic has given us some insights into what that could look like and how it could be mobilised at global scale: governments issuing 'challenge based' requirements; supporting through upfront funding (or contracts to purchase); and underwriting risk to support rapid innovation and market entry, and provide protections to industry. During the pandemic we saw all sorts of businesses and researchers come together to produce ventilators, PPE and, of course, vaccinations – great examples of global knowledge sharing and collaboration. We need to reproduce the best elements of that to tackle climate change.

**Q** What are some of the most exciting innovations or collaborations you've seen in the en-tech industry and how do you see the built environment fitting into that?

**LY** Buildings and infrastructure need to be fit for the world we're moving into, not just based on things as they are today. Historically – and with the notable exception of a handful of countries – there hasn't necessarily been a very close or strategic relationship between the building and energy sectors.

In the future we need to see much stronger collaboration between the energy and built environment sectors to support at least three fundamental shifts. The first is to repurpose land to take developments to the existing power grid infrastructure where it makes sense to do so, instead of building the grid out to new developments – this can avoid significant additional costs of grid infrastructure. The second is to make every building smarter and more sustainable through retrofit, modifications and good design and materials choices. And the third is to bring community and local energy planning into the design of all new developments – district heating, local solar PV and small grid-scale storage being three interesting examples of things that are yet to be exploited to their full potential.



**Having a model that allows for all the variety of the real world means we can model the impact of different policy decisions in a people-centred way.**

**Q** What's your vision for Centre for Net Zero?

**LY** We're here to move the needle on climate and energy policy, globally. We don't have the luxury of time, so we're moving quickly with our own research and planning solutions to scale our impact quickly. One of the ways we're doing that is by building our climate and energy models so they can be easily adapted and reused by others around the world – and open sourcing the software. That means if you're interested in modelling (for instance) buildings and heat (or cooling) or transport decarbonisation pathways in some specific part of the world, you can plug your own data into our models and play around with the assumptions and inputs to make them more relevant to your local environment. We're especially interested in cities because they make a disproportionately large contribution to greenhouse gas emissions – so making inroads into decarbonising cities is particularly important. In the next 12 months we'll work more closely with place leaders to help them develop their local Net Zero strategies.

Pretty much every person on the planet relies on heating (or cooling) and transport, so every dwelling needs to go through the transition to net zero at some point. Awareness of low carbon technologies is still low in a lot of places. Industry can help here – by educating consumers, investing in R&D to bring costs down, and building propositions that make purchasing and owning green technologies as simple and effortless as possible.

**Q** What's your experience of coming on board as CEO?

**LY** There are so many people and organisations talking about the climate emergency and the energy transition – but talking about these things is really the equivalent of level one of a 100 level game. I knew from day one that we had to be focused on having the highest impact possible, as quickly as possible. In practice this has meant being ruthless about the scope of our work and having the conviction to publish 'good enough' work early on, accepting and acknowledging where it has limitations.

Of course I've also had the unorthodox experience of building a completely new organisation from scratch in the middle of a pandemic-induced lockdown! Some weeks and months I've been incredibly busy while barely setting foot outside my house.

Right: Centre for Net Zero team

**Q** How important is cross-collaboration and breaking down mindset barriers when it comes to net zero?

**LY** A few years ago I spent some time studying change leadership at Harvard's Kennedy School. We focused on change that requires cooperation between public and private sectors and worked with the most extraordinary set of real-world case studies of people who had mobilised system-level change in their communities, cities and regions. The one common thread through them all was the sheer challenge and grit needed to go through these stages of public awareness, education, acceptance and finally support – all of these incredible public leaders doing great things but encountering such public resistance.

Winning over hearts and minds is hard, even if you're equipped with evidence to prove it's the right thing to do. This is why the approach that we're taking at Centre for Net Zero is so valuable. We're using an agent-based model for our research. The advantage is that we can have agents that are people and households. We all know that people and households are not homogeneous and they make different decisions. Having a model that allows for all the variety of the real world means we can model the impact of different policy decisions in a people-centred way, reflecting what happens when individual people and households have agency. This is an important point – nobody ever likes to have change done to them, even if they might benefit from it. If we accept that people must have agency, then it's very useful to be able to model what the expected outcomes will be.

**Q** And finally, what gets you excited about the coming years?

**LY** For the next few years, I'm excited about the sheer scale of investment that we'll see piling into climate and energy, both private and public. Investment unlocks ingenuity and ingenuity means innovation. So we can be very confident that we'll see inspiring new green businesses and products coming to market for the first time and some of them will be global household names of the future.

I'm also excited about some of the technology developments and applications we'll see over this timeframe – there is a saying that we tend to overestimate the impact of technology in the short term and underestimate it in the long run – and it's easy to point to examples of that in other areas of our lives. In particular, I think we'll see very widespread application of AI right across future energy systems.

Looking into the next few decades, there are plenty of things that can give us hope and optimism. Over these timeframes, the natural churn of politics means we'll reach the point at which today's school children will be running the show. This generation is digitally native but adopt different and more sophisticated attitudes to resources, sustainability and consumerism compared to those of my generation, or before. I think they might surprise us all with the boldness of the policies they introduce and their willingness to embrace data and technology to hold the most inveterate polluters to account... □



**Nobody ever likes to have change done to them, even if they might benefit from it. If we accept that people must have agency, then it's very useful to be able to model what the expected outcomes will be.**



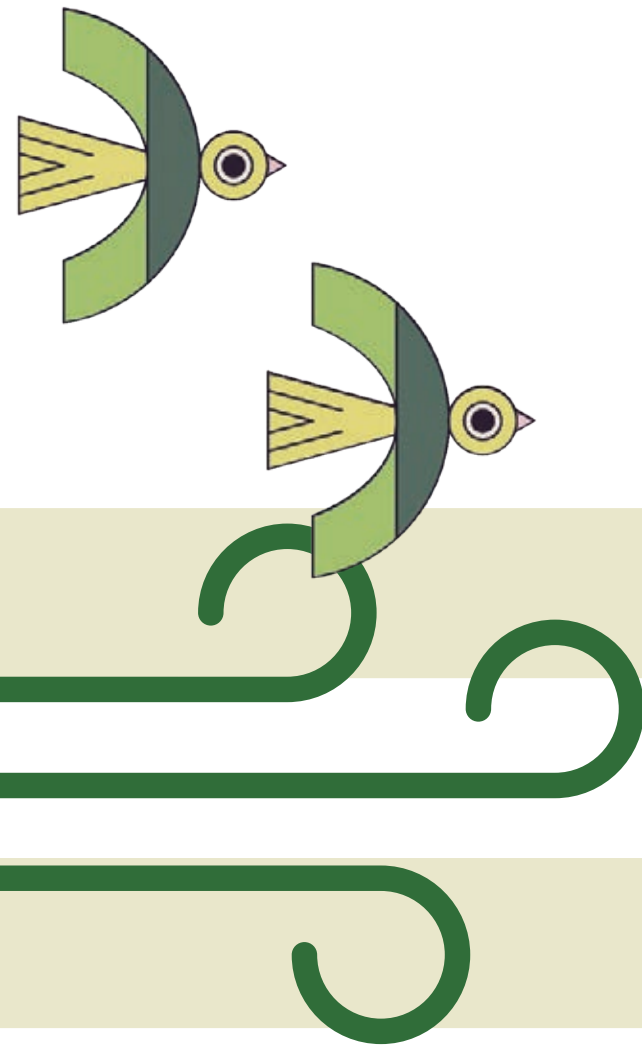


Image: Bennetts Associates

**Timber Square.**

The client	Landsec
The architect	Bennetts Associates
The expertise	MEP, Sustainability, Acoustics, Air Quality, Fire Engineering, Intelligent Buildings, Security, Lighting Design, Performance, ICT, Net Zero Carbon, Vertical Transportation
The challenge	To deliver a ground-breaking net zero carbon scheme by predicting and optimising the energy performance of the development, working as Design for Performance 'Pioneer Partners'.
The sector	Workplace, Mixed-use





**Societal evolution:**  
'The shared experience'

**Individual evolution:**  
'Mindful living'

**Natural evolution:**  
'Realigned to a nature-led philosophy'

**Physical evolution:**  
'Relevant in times of revolution'

# The way the wind blows.

People, places, possibilities... what will the next decade hold for the ever-evolving reality of sustainability?

Illustrations by Owen Davey

**Economic evolution:**  
'The future belongs to the curious'



LET'S TALK  
JamesFord@hoarelea.com  
GregJones@hoarelea.com



The concept of ownership is waning. With greater proportions of society preferring to share assets and experiences, more and more people will come together around a common platform, be that transport, open space, food, leisure and other amenities. Flying abroad may drop in popularity, and people will look to their community for experiences available on their doorstep... Even better? If those experiences can be diverse and multi-cultural, bringing the world to our own corner of planet.

# Societal evolution: ‘The shared experience’.

## A strengthened community.

Communities are the building blocks of a lively, interconnected network of services and relationships that enable places to thrive. Simply constructing buildings in isolation is not enough. Highly inclusive, fluid and connected public spaces cohere people together and help create a vibrant community. Knitting the existing with new and honouring local spirit will spark strong community integration.

## Embracing diversity of people, activities and experiences.

Using the ‘feel-good gravitational force’ of activity and experiences, places can draw in people from all walks of life, increasing the overall value created by a site. Single-use buildings (much like single-use plastics!) will become the minority. In their place, hubs made up of homes, workplaces, retail and leisure spaces, with strong public transport networks will become the norm. By activating public spaces from the outset, activities will emerge organically in response to demand, and design inclusivity will ensure appeal to a wide range of social and demographic groups.

## Empowered local voice.

Asking, listening and being open to challenge will foster community engagement as an iterative process throughout placemaking. This transcends consultation and enables local communities to generate ideas and collaboratively co-create a place. Diverse engagement methods and communication channels will be deployed to engage audiences who are typically less involved with such processes, and balance out the vocal minorities who tend to dominate the conversation. Success will be defined throughout the lifespan of a development at a multiplicity of junctures, and engagement will take an array of different forms responding to the context. Inclusivity and transparency will help build trust, confidence and a dialogue that leads to opportunities on all sides.

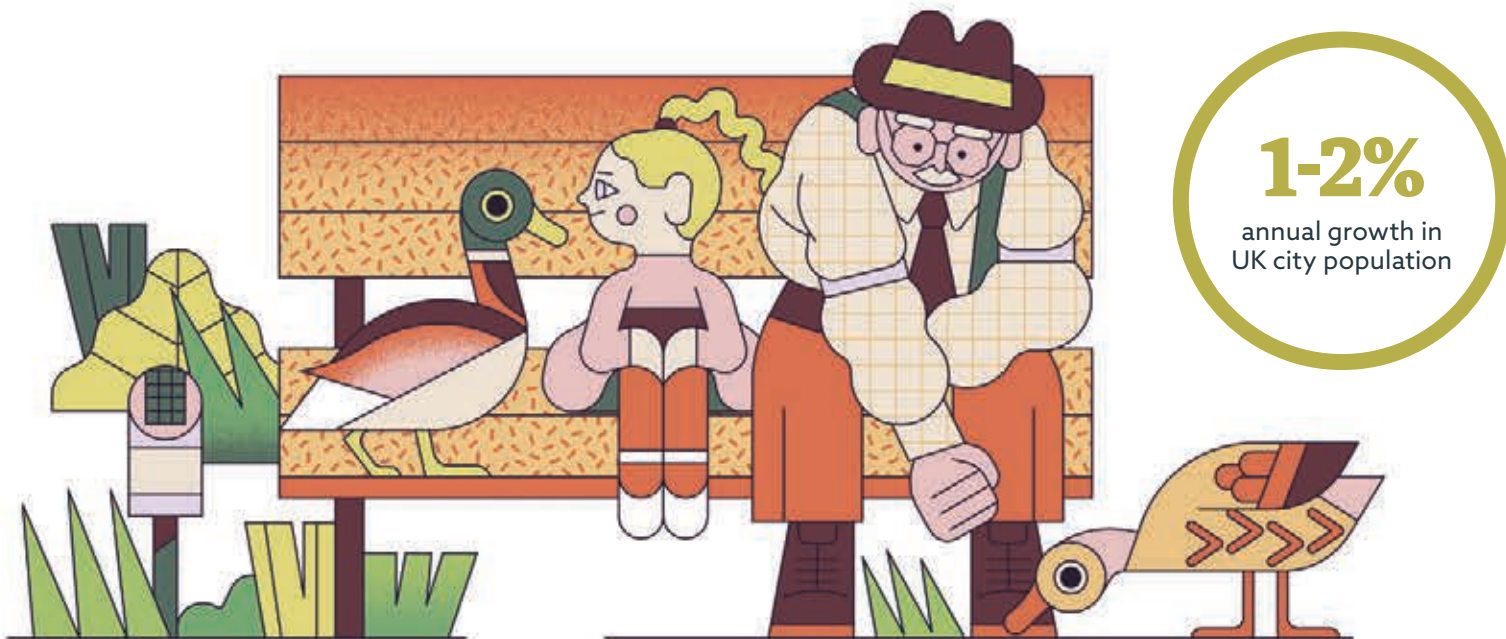
The sharing economy is expected to grow **1,000%** over the next decade

One shared vehicle could replace **15** on the street

**>25%** of people in cities live alone





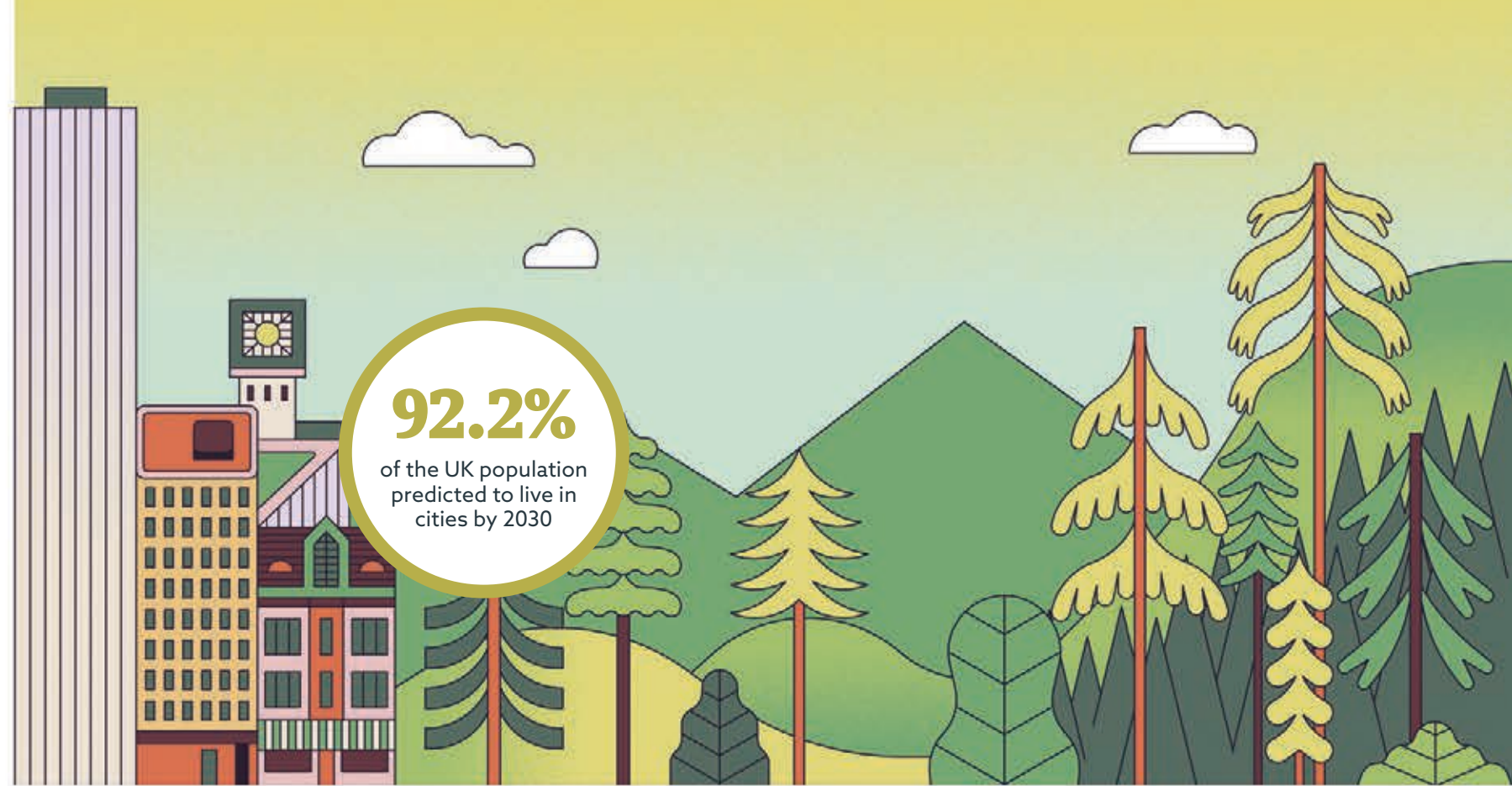


**1-2%**  
annual growth in  
UK city population

People have never been more aware of what they need to be well. Yet, often access to facilities to lead healthy, active lifestyles can be limited... Cities and placemaking present a multitude of opportunities where small changes can make massive impacts – from jobs, to transport, social experiences, and community connections. Locations that offer people a place for wellness will be in high demand...



**>50%**  
living in urban areas  
considering moving  
to a different  
location



**92.2%**  
of the UK population  
predicted to live in  
cities by 2030

# Individual evolution: ‘Mindful living’.

## Personal needs become sacrosanct.

With the growth of technologies such as personal assistants, people have greater access to data on their wellbeing and are more informed than ever about the benefits of having healthy lifestyles. We also increasingly more tapped into our own personal needs, and how they might differ from others, whether mentally or physically. Wellbeing requires an element of control and autonomy over our own bodies and decisions, so places that offer us flexibility and freedom will naturally move further up the desirability chain.

## Cultivating urban wellness.

Wellness spans both the conscious and subconscious. Inclusive public space, green infrastructure, accessible public realm and people-centric design and mobility come together to create a holistic health landscape for all. Ultimately, cleaner, quieter and healthier environments encourage people to walk and play, to discover and share, to meet and talk. Places will respond to the innate human need to connect with nature, by integrating biophilic design elements within buildings, celebrating the horticultural heritage of an area, and maximising the potential of public space from both an ecology and people perspective.

## Safe, inviting environments.

How safe a place is directly related to how safe a place feels. Creating reassuring but also inviting environments will be given prime consideration from the outset, ensuring that we all feel safe in large gatherings and accessible areas. Attractive and sociable public spaces will provide a natural stimulus for opening up areas and enhancing inclusive access to spaces, but also ensuring people’s safety in unobtrusive, and often nature-led, ways.





Modernism has been at the vanguard of design for the last century. Characterised by simplicity of aesthetic, open spaces, 'clean lines', in many instances, the style has led to a disconnect from nature. In 2100, when we look back at the defining style of our current age, could we recognise the re-birth of Naturalism as the leading philosophy of the time? Would this apply not only to design and placemaking, but in how people choose to live? Will we exist as part of nature, not in defiance of it?

By 2030, adopting circular economic models could generate as much as **\$4.5tn**

Globally, demand for fresh water could exceed supply by **40%** by 2030

Hydroponic farms enable us to grow greens 3 times faster than in a field, with **90%** less water

# Natural evolution: 'Realigned to a nature-led philosophy'.

## Connecting people with nature.

Success lies in not bringing the natural 'into' the built environment, but rather in blurring the lines between the two. We will see welcoming and accessible spaces where people enjoy and interact with nature. This new approach is about amplifying and cultivating an affinity with the natural world. A compilation of green streets, spaces, places and activities bring an array of benefits, from improved air quality to resilience and urban tranquillity. These are garden-city principles combined with the density of urban amenity.

## Celebration of natural diversity.

The productive power of nature-based solutions will be central, not only to enhancing biodiversity but also to creating broader social, environmental and economic gains. An emphasis on diverse and natural habitats, along with green and blue infrastructure within developments will nurture climate resilient, living ecosystems and create temperatures comfortable for all. Strategic landscaping will increase species' resilience to factors like disease, climate change and invasive species. Government-led Local Nature Recovery Strategies will have restored key areas. Nature's value is amplified when it flourishes and, ultimately, strengthens

our ability to depend on natural systems for food security, water management, air quality and temperature regulation.

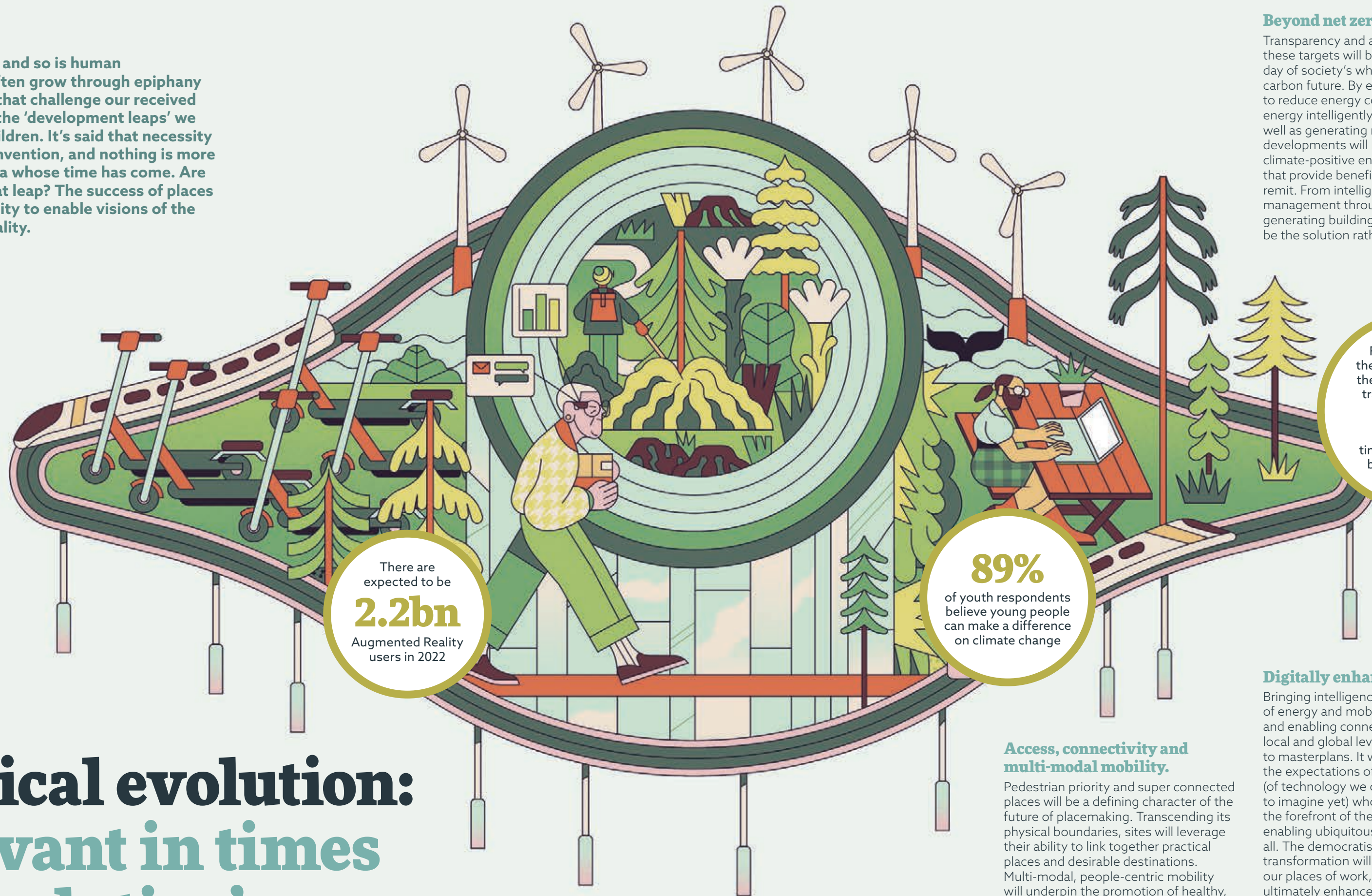
## Championing the circular economy.

The key principles of durability, disassembly, re-use and adaptability will enable the efficient use of natural resources during a development's lifecycle. Modern will be mainstream when it comes to methods of construction. The industry will replace its indulgence in inefficiency and waste, and instead embrace a creative productivity... One that captures the sculptural art in architecture in combination with the natural poetry of circularity.

Water is an impending crisis that hasn't yet hit the collective UK consciousness. Urban environments will be planned and constructed to soak up almost every raindrop and capture that water for reuse. Recycled water can be used to recharge depleted aquifers, irrigate gardens and urban farms, or - when properly treated - can replace drinking water, flush toilets or even clean homes.



Change is non-linear and so is human development - we often grow through epiphany or eureka moments that challenge our received wisdom, mimicking the 'development leaps' we make when we're children. It's said that necessity is the mother of all invention, and nothing is more powerful than an idea whose time has come. Are we due the next great leap? The success of places will hinge on our ability to enable visions of the future to become reality.



**Beyond net zero.**  
 Transparency and accountability against these targets will become the day-to-day of society's whole-life net zero carbon future. By embracing innovation to reduce energy consumption, using energy intelligently, and sourcing as well as generating renewable energy, developments will have adaptable climate-positive energy strategies that provide benefits outside of their remit. From intelligent energy-demand management through live data, to energy generating building facades, buildings will be the solution rather than the problem.

Firms that are in the top 20% for both the green and digital transformation are **x2.5** times more likely to become industry leaders

There are expected to be **2.2bn** Augmented Reality users in 2022

**89%** of youth respondents believe young people can make a difference on climate change

# Physical evolution: 'Relevant in times of revolution'

**Access, connectivity and multi-modal mobility.**  
 Pedestrian priority and super connected places will be a defining character of the future of placemaking. Transcending its physical boundaries, sites will leverage their ability to link together practical places and desirable destinations. Multi-modal, people-centric mobility will underpin the promotion of healthy, active lifestyles and foster the creation of diverse communities. A development will stitch into the local area, linking public transport nodes while leveraging network connectivity to influence wider Net Zero Carbon ambitions for surrounding areas.

**Digitally enhanced lifestyle.**  
 Bringing intelligence to the operation of energy and mobility infrastructure, and enabling connectivity at a personal, local and global level will be fundamental to masterplans. It will involve meeting the expectations of early adopters (of technology we cannot even begin to imagine yet) who will always be at the forefront of the hype cycle, while enabling ubiquitous empowerment for all. The democratised evolution of digital transformation will be supported through our places of work, rest and play, and ultimately enhance our everyday lives.

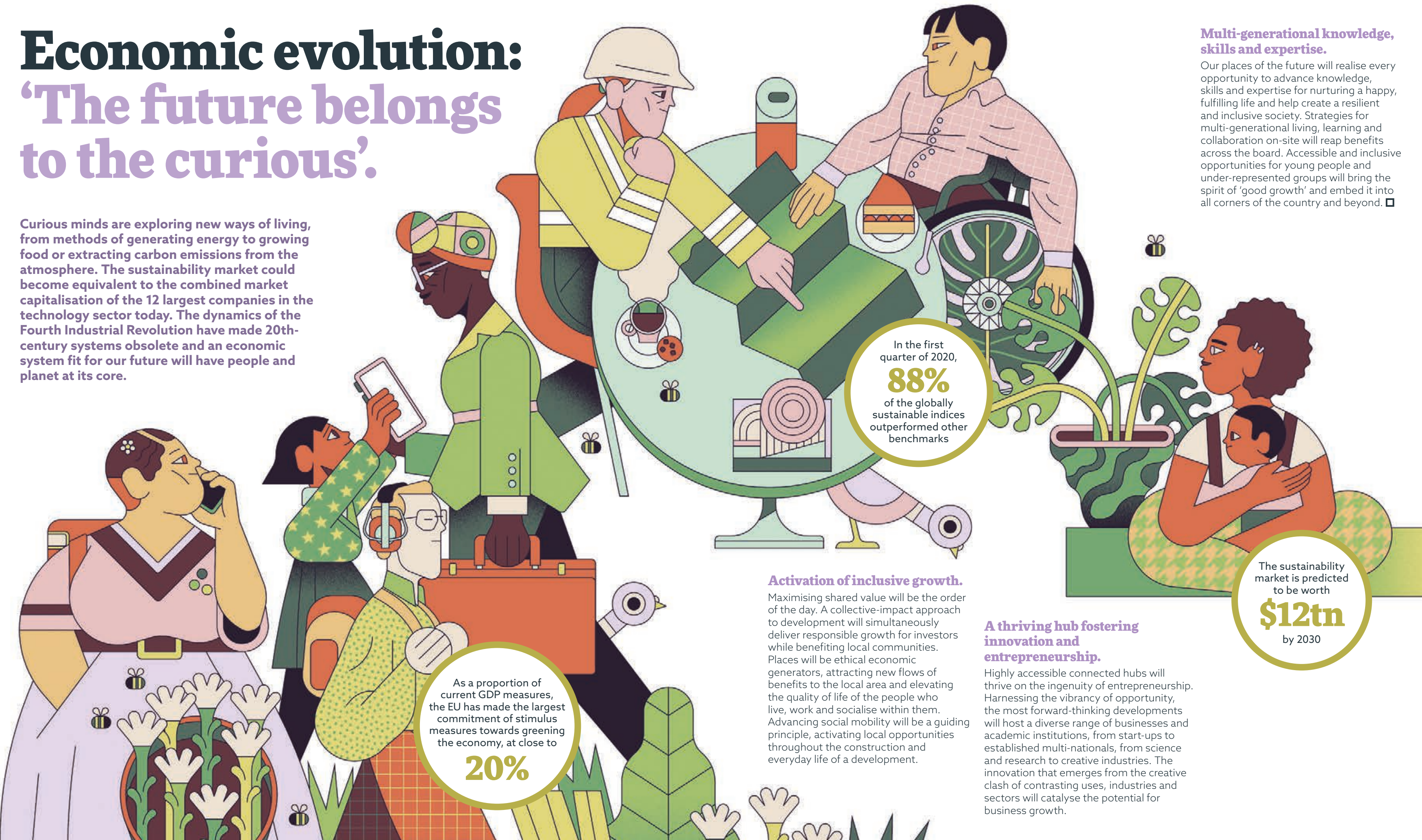


# Economic evolution: ‘The future belongs to the curious’.

Curious minds are exploring new ways of living, from methods of generating energy to growing food or extracting carbon emissions from the atmosphere. The sustainability market could become equivalent to the combined market capitalisation of the 12 largest companies in the technology sector today. The dynamics of the Fourth Industrial Revolution have made 20th-century systems obsolete and an economic system fit for our future will have people and planet at its core.

## Multi-generational knowledge, skills and expertise.

Our places of the future will realise every opportunity to advance knowledge, skills and expertise for nurturing a happy, fulfilling life and help create a resilient and inclusive society. Strategies for multi-generational living, learning and collaboration on-site will reap benefits across the board. Accessible and inclusive opportunities for young people and under-represented groups will bring the spirit of ‘good growth’ and embed it into all corners of the country and beyond. □



In the first quarter of 2020,  
**88%**  
of the globally sustainable indices outperformed other benchmarks

As a proportion of current GDP measures, the EU has made the largest commitment of stimulus measures towards greening the economy, at close to  
**20%**

### Activation of inclusive growth.

Maximising shared value will be the order of the day. A collective-impact approach to development will simultaneously deliver responsible growth for investors while benefiting local communities. Places will be ethical economic generators, attracting new flows of benefits to the local area and elevating the quality of life of the people who live, work and socialise within them. Advancing social mobility will be a guiding principle, activating local opportunities throughout the construction and everyday life of a development.

### A thriving hub fostering innovation and entrepreneurship.

Highly accessible connected hubs will thrive on the ingenuity of entrepreneurship. Harnessing the vibrancy of opportunity, the most forward-thinking developments will host a diverse range of businesses and academic institutions, from start-ups to established multi-nationals, from science and research to creative industries. The innovation that emerges from the creative clash of contrasting uses, industries and sectors will catalyse the potential for business growth.

The sustainability market is predicted to be worth  
**\$12tn**  
by 2030





<b>Carbon Neutral Estate, Bristol City Council.</b>	
The client	Bristol City Council
The collaborators	Avison Young
The expertise	Sustainability, Net Zero Carbon, ESG
The challenge	Creating low, medium and high ambition decarbonisation and reduction scenarios supported by net-present costs to inform decision-making.





PEOPLE

Two industries... one ultimate goal,  
but entirely different languages.

We took a step towards tackling the  
language barrier of Net Zero Carbon  
with a tool as old as time... talking.

# Two sides of the same coin.

Paul Nicoll, Triodos Bank  
Frances Brown, Hoare Lea

Photos by James Cheadle





**With the pressure-cooker that is the carbon challenge only set to get more intense in the coming years, the world of finance is beginning to demand bold action from the construction and real estate industry. It's a recipe that could easily lead to frustration, finger pointing, and worst of all failure to achieve the Paris Agreement targets. Breaking down the language barrier between both industries is the first step to an empowered ecosystem existing between them... one fuelled by dialogue, insight and true understanding of the challenge.**

**These are big conversations, but they can start small. In the week before COP26, Paul Nicoll from Triodos Bank UK joined Frances Brown to explore the common threads, needs, and mutual benefits between Zero Carbon investment and development – a discussion that simply would never have taken place just a few short years ago.**



**Frances**

So Paul, what put Zero Carbon on your radar?

**Paul**

Well it's a term that's been quietly bubbling away for years now in our industry, but it's only in the past 18 months or so that it's properly come to the fore and has begun to dominate so much of our thinking and decision making. Obviously, our ethos at Triodos has always been about ethical and sustainable investment, and for over 40 years that's meant supporting sustainable assets across a number of sectors. Energy has been a big part of that, in terms of financing renewable energy projects, new technologies and energy saving projects. But we now have an urgency; we need the eco or social-led developers whose projects we finance to measure and report against the specific targets in terms of carbon, not just in the construction phase but in terms of ongoing usage too.

**Then of course, in tandem, there's our own proactive pledge. We've joined the Net Zero Banking Alliance convened by the UN, which is a commitment to look at our own operational and lending practices.** It means setting a science-based Net Zero target, informed by a full understanding of all our current carbon impacts and those of our loans and investments. So, plenty to keep us busy!

**Frances**

Absolutely, I think that's a statement that holds true for almost every industry... It's no longer an overstretch to say it's become business critical; at least if you want a business that will still exist in 20 years! **The conversations that are happening now are really exciting to be honest – in the 14 years I've worked on developments in London, we've gone from clients adding on sustainability credentials as an 'extra' to now starting with carbon considerations, and ESG strategies leading the decision making.** There was a time where the main risk for a building was that it wouldn't have enough capacity to meet demand. Now, both in terms of embodied and operational carbon, the risk is you have too much!

Yet, I do think we also have to remember that although there is lots of progress in terms of mindset switch, so much of the reality of actually achieving Net Zero Carbon is new to people. Even in our engineering world where we know both the principles and practicalities of it, it's still new. For example, I'm on the Board of Management at the British Council for Offices as I specialise in workplace development, and NABERS UK has only just launched the energy efficiency rating scheme, based on measured outcomes for offices that's aligned with Net Zero targets... And even on some of the most progressive pilot projects, we're still only a year or so into actually having fully

complete buildings that can be measured and reported on. So, it's understandable that there's still a lot of confusion around the topic.

**Paul**

Yes, there's so much noise, isn't there? We haven't challenged hugely in the past on metrics, but we are beginning to now. There is potentially some confusion at the smaller end of the market, because so many businesses understand the broad concept of the phrase Net Zero Carbon, but they don't yet understand practicalities around the implementation of it. Awareness and education need to be prioritised and it needs to be reliable and consistent.

**These sorts of conversations aren't stopping at building or development level; every other sector we work with, whether that be retail, organic farming, education, social housing, or healthcare; everyone is trying to understand what's critical, what's real, and how best to achieve these goals.**





#### Frances

Exactly, each sector is having to carve out its own parameters, but the one thing that's universal is the need to monitor. How can you improve on something you aren't yet even measuring? It's fascinating to me that positive pressure from the investment world has now made the conversations happen in development that we've been talking about for years – that you need to monitor a building to ensure it actually performs as it was designed. **So often, buildings are designed to be incredibly energy efficient, but what actually changes the performance of a building in reality is behaviour – the people using it.** So if we can monitor developments to understand exactly what's happening in terms of the human interaction, we can understand how to make it perform as intended rather than actually having to make wholesale changes to the building itself.

#### Paul

Sure... the monitoring is critical. We need to be assured that what's coming out at the end can be relied on and is comparable for all.

#### Frances

Yes, and the only thing you can ultimately rely on is what's monitored and reported! Even as an insider in the industry, it seems counter intuitive to me that it's not standard practice for the development world to actually check that the projects they paid for perform as intended...

#### Paul

I completely see your point... I remember being involved in the finance of a development 10 years ago that had – at the time – a state-of-the-art climate-controlled system. It was incredibly complex, and a few people in the building management team understood it on day one, but six or seven years down the line, the knowledge had waned, and efficiencies and good practice were being lost.

#### Frances

It's something we see time and time again when we're brought in to improve existing buildings and it speaks to the benefits that can be grasped by developers who keep their assets. They have this amazing chance to have the most incredibly efficient portfolios, by just investing a little in operational knowledge retention. Now we exist in a world that increasingly needs us to think about long-term value from a profit point of view, it's so much more advantageous over building something purely to be sold on in the short term.

#### Paul

That's so interesting you say that, because that long-term value is something we've always considered, and it's exactly what's leading the insistence on science-based Zero Carbon targets in the finance world. Even though we fund social-purpose-led landlords, who are thinking about more than just profit, we still have the question of a development's market value, which in turn also depends on its current and ongoing carbon efficiency. We're now asking, firstly, is our security going to degrade over time if money isn't spent on it to bring it up to standard? Secondly, can all socially-led organisations afford and plan that expenditure, and if the answer is no, how can we work with them to help them understand and afford it?

#### Frances

Talking of the cost of carbon reduction, as you say, there has to be some investment. I also think it's really important for both our industries to dispel the myth of anything that's good for the planet costing more. Reducing embodied carbon, in the case of new builds or retrofitting can be about doing less, and it's the same for operational carbon. **They both certainly require more thought – the kind of thinking that perhaps hasn't been part of the conversation before – but they aren't always about spending more.** There are now financial reasons to go for high standards in carbon reduction. Years ago, it could have 'made sense' to build a huge basement to accommodate technology that would reduce carbon usage in an operational sense or create better amenity space on upper levels. But now this is less acceptable; there would be a massive cost in terms of embodied carbon because of all the material used to create basement space. There was a recent project that really brought this home to me – a developer who had a set pot of money specifically dedicated to reducing embodied carbon. But the solutions we kept finding for that reduction kept making overall cost savings... we got to the point where they were saying, "how do I actually spend this money?!".



#### Paul

Ah yes, that embodied carbon conversation is one we're trying to find our way with. We've often funded the repurposing of older buildings, which we know is beneficial from an embodied carbon point of view – as opposed to tearing something down and starting again. For instance, a decade or so ago there was such a trend towards repurposed old warehouses (tech companies and creatives love them so they have great market value), but ultimately, they are large, draughty buildings that often make for a poor carbon impact. So, in the context of Net Zero Carbon targets, we now need to be asking more questions in this area and work out the effect of retaining them versus complete redevelopment... and that's no doubt the same for most investors. We just don't have the consistency and clarity of information to make truly informed decisions at the moment. It's important to consider expert input for those scenarios – people who can help us and our customers see where the risks and opportunities are.

**Even for our own head office in the Netherlands, which opened in 2019, we couldn't find suitable existing office space available for redevelopment, so constructed a brand-new building. However, it's completely focused on circularity and could be dismantled and built elsewhere – like a giant Lego set. It has been created with a long-term view in mind – sustainable in construction, operation and – eventually – reuse.**

#### Frances

Absolutely, every building is different. There are general principles in terms of what's best from a carbon point of view, but they always need to be balanced against so many other factors – cost, social considerations, preservation considerations, and so on – all of which are so specific to a development. One positive to consider, though, is that instinctive feeling more of us have now, no matter what the industry – that tearing something down and rebuilding can be a bad idea when it comes to the planet – will start to become the norm; the default that has to be explored before anything else. There are plenty of buildings that could have their operational efficiency reduced significantly by looking at performance improvements, and then by 2030 – as long as they continue to monitor and refine that behavioural aspect – hit the carbon targets thanks to a decarbonised grid. So, what seems like an almost insurmountable challenge for some buildings, will become easier thanks to more broader help along the way... The real positive is that the finance world asking these kinds of questions isn't something that ever would have happened five years ago; we've got a long way to go, but I think the first few hurdles are already cleared! □



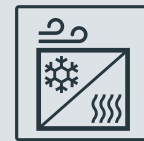


**“The money we are saving means we won't have to dip into our savings for essentials.”**

A family with three children aged between 10 and 17 was previously spending £200 per month on energy payments, and is now seeing greatly reduced monthly bills.

**90%**  
Reduction in energy bills

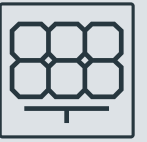
Rhiw Cefn Gwlad housing, Bridgend.	
The client	West & Wales Housing, supported and part funded through the Innovative Homes Programme
The architect	Solcer Ltd
The expertise	MEP, Performance, Sustainability
The challenge	Crafting an integrated blend of design methods and technologies, 12 months of monitoring, and optimisation to achieve the country's first energy-positive housing that also helps to address fuel poverty for residents.
The sector	Residential (affordable housing)



**Air source heat pump system linked to a Mechanical Ventilation Heat Recovery (MVHR) system**



**Structured Insulated Panel (SIP) system and air tightness measures**



**Photo Voltaic (PV) 'in roof' panels**  
3.7 - 7.4kW capacity

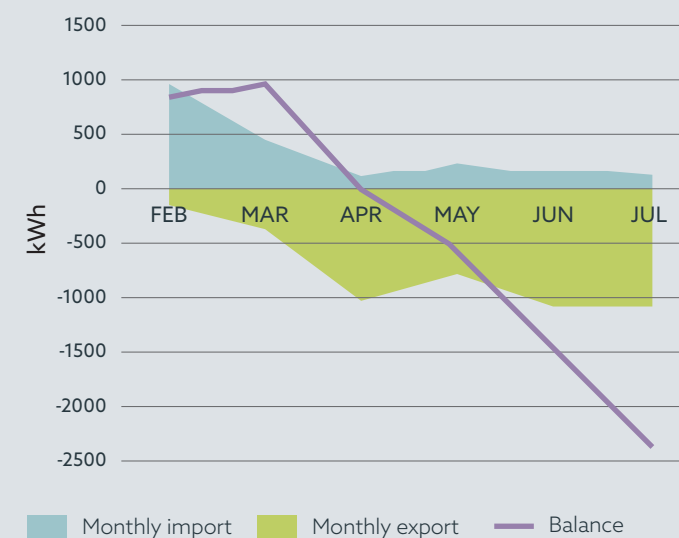


**Tesla Powerwall 2 battery**  
Up to 5kW output  
13.5kWh storage capacity

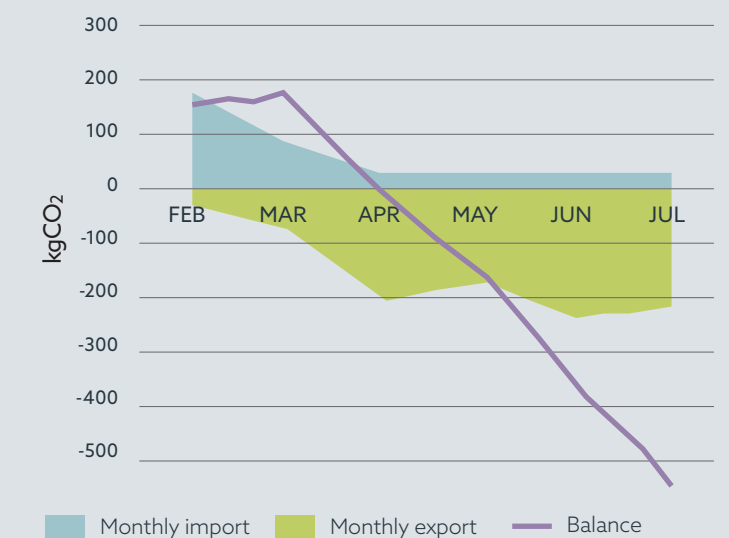


**Bespoke monitoring & sensing strategy**  
'In use' performance monitoring & reporting

Total energy balance of 4-bed homes (Feb-July 2021)



Total carbon balance of 4-bed homes (Feb-July 2021)



The 'energy positive' and 'carbon negative' targets for these homes will have been achieved if the purple balance lines end the 12 months below 0.



# The right route.

## A pathway to Net Zero for the UK built environment.



As part of the World GBC's #BuildingLife initiative, the UKGBC has been leading an industry-wide project, bringing together key industry stakeholders to define a Net Zero Roadmap for the UK Built Environment. Led by Hoare Lea's Tom Spurrier, the team of four task groups have worked collaboratively to set out the carbon reduction interventions and supporting policy drivers required to transition to Net Zero by 2050. With the Roadmap ready to be launched at COP26 during Cities, Regions and Built Environments Day, Tom shares the steps taken so far...

### Project Director, Hoare Lea & UKGBC Project Lead secondee Tom Spurrier:

"This true example of industry collaboration began with bringing together key representatives from across the built environment sector to shape the proposals. Four task groups comprised of over 70 experts have been formed to work through the implications of decarbonisation across sectors and to develop a timeline of solutions.

"What makes the project more exciting is that it's just one of many. The development of national Roadmaps are being led by GBCs across 10 European markets and will allow a common vision for achieving net zero carbon in the construction, operation and demolition of buildings and infrastructure.

"It's been an incredible opportunity to work with so many experts from different sectors. The issues around decarbonisation of our buildings and infrastructure can be boiled down to some really simple messages, but the

delivery of this at scale across the entire industry quickly becomes a complex and interrelated puzzle.

"Sharing the findings of the project with policy-makers is critical, and we've had close engagement with key government departments, as well as the Committee on Climate Change throughout the process.

"We now have some very clear messages on how the regulatory approach to energy performance of buildings needs to change, and the speed at which this needs to happen. Measurement and regulation of embodied carbon is also a critical recommendation, as although this can form up to 50% of project life-cycle emissions, mitigation is currently entirely voluntary.

"Ultimately, I'm hopeful the project will galvanise industry action as we embark on the decade of action needed to resolve the climate crisis." □

**LET'S TALK**  
TomSpurrier@hoarelealea.com

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Hoare Lea is an award-winning engineering consultancy with a creative team of engineers, designers, and technical specialists. We provide innovative solutions to complex engineering and design challenges for buildings.

Irrespective of the scale or complexity of a project, we provide a full range of MEP, environmental, and sustainability services, bringing buildings to life and ensuring that they perform in operation as well as they look.

#### Locations

Abu Dhabi, Birmingham, Bournemouth, Bristol, Cambridge, Cardiff, Doha, Exeter, Glasgow, Leeds, London, Manchester, Oxford, Plymouth, Reading, The Arc (Milton Keynes), Madrid (associated office).

#### Expertise

Acoustics, Air Quality, Audiovisual, Building Intelligence, Digital Engineering, Environmental planning, Expert Witness, Façade Access, Fire Engineering, ICT, Lighting Design, MEP, Net Zero Carbon, Operational Engineering, Performance, Property Services, Research & Development, Security, Sustainability, Utilities & Energy, Vertical Transportation, Vibration.

#### Sectors

Arts, Culture & Heritage, Courts, Data Centre & Mission Critical, Defence, Distribution, Healthcare, Higher Education, Hotels, Manufacturing & Process, Prisons, Residential, Retail, Schools, Science & Research, Sport, Transport, Workplace.

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**Exploare.**  
The future belongs to the curious.  
Challenge accepted.





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## Exploare.

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DATA-DRIVEN CLIMATE  
ACTION WITH LUCY YU

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INVESTMENT OPPORTUNITY  
WITH ROBERT WINCH

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THE CHANGING FACE OF  
SUSTAINABLE DESIGN

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EMPOWERED ECOSYSTEMS  
WITH INDUSTRY EXPERTS

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WHOLE LIFE CARBON  
WITH TOM SPURRIER

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LEADING THE WAY WITH  
PIONEERING PROJECTS

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