

ISSUE 5 WINTER 2020 HOARELEA.COM

The future belongs to the curious.

# Exploare®

A magazine from Hoare Lea

The future belongs to the curious.

**“Strength lies in differences, not in similarities.”**

Stephen R Covey



**Places.**

**People.**

**Possibilities.**

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A driving force for good

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FOREWORD

Designing 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.

Exploration is our way of believing in a better future. Discovery, direction, and development – in parallel with purpose – is all about moving forward. It doesn't matter how little we know about what lies ahead... there is joy to be found in the not-knowing. In fact, the true joy comes from understanding that our decisions, our development, and our determination for better shapes what it will hold.

Together, we make a mosaic of visions for the future... each of us bringing our own unique aspirations, but also united by the collective desire for a thriving planet and human race. Achieving it requires the ultimate human challenge: "the art of thinking differently together".

**Exploration is grounded in hope. It's being open to what you don't yet see.**

Hope, purpose, and participation is a potent fuel that allows "common people to attain uncommon results". As a certain Charles Darwin said: "those who learned to collaborate and improvise most effectively have prevailed." Exploration on our own can be insightful; exploration with friends can be effective... but it's exploration in tandem with others from all walks of life that brings about real change. When all voices are heard, progress happens... and if we count on each other – if we play our part in supporting the whole team – we might just win the game.

# The trend report.

## Perceived daylight quality in spaces.

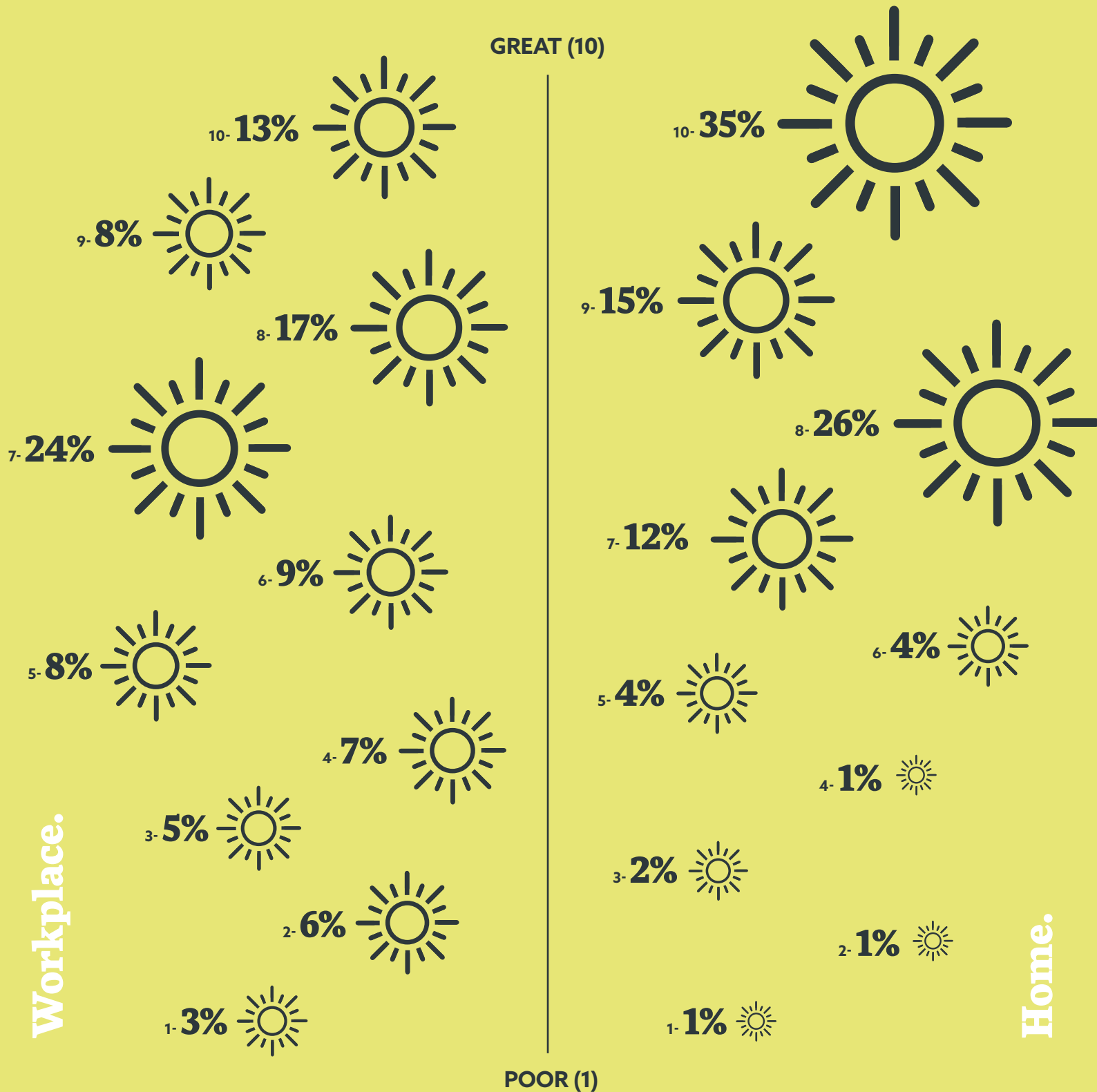
LIGHTING CONDITIONS WHEN WORKING IN OFFICE VS HOME

Online survey conducted June 2020

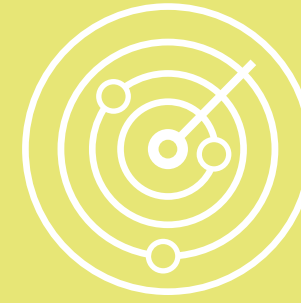
WHO? 178 participants both from Hoare Lea and the wider industry.

WHAT? Participants rated the perceived quality of daylight at their office desk vs WFH space from 1-10.

WHY? To explore the impacts that home-working has on health and behaviour.



### On the radar.



## 1.

### COVID-SECURE SPACES

The airborne route of viruses is a new challenge when it comes to indoor spaces. It requires the best possible understanding, control, and monitoring of indoor ventilation.

Let's talk - [SteveWisby@hoarelea.com](mailto:SteveWisby@hoarelea.com)

## 2.

### A BOLDER BUSINESS APPROACH

Environmental, Social, and Governance (ESG) issues are gaining traction as a standard business practice, and increasingly becoming a core aspect of long-term value creation strategies.

Let's talk - [DianaSanchez@hoarelea.com](mailto:DianaSanchez@hoarelea.com)

## 3.

### HEALTH, WELLBEING & INCLUSIVE PLANNING

An RTPi research paper has called for the greater use of Health Impact Assessments "as an important step towards the implementation of healthy placemaking outcomes in planning".

Let's talk - [MarkCope@hoarelea.com](mailto:MarkCope@hoarelea.com)

## 4.

### BALLET IN THE SPOTLIGHT

The English National Ballet HQ in east London was named AJ100 Building of the Year 2020, with judges noting: "This feels like a simple building and yet it is unbelievably complex in what it needs to accommodate."

Let's talk - [MaxFoster@hoarelea.com](mailto:MaxFoster@hoarelea.com)

### Conversation kickstarter.

**"On a very basic human level, this year has ensured we all understand to a much greater degree the importance of public life, public spaces, access to greenery, clean air and so forth..."**

Helle Søholt, Gehl

**"The cost of designing poorly almost never gets measured."**

Wayne Hemingway, Hemingway Design

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

### Kaizen corner.

改善

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

Putting people with a diversity of age, ability, gender, ethnicity, and experience etc at the heart of the design process is the only way to ensure an inclusive approach to planning, design, and management. It's our opportunity to create desirable places that reflect and serve society.

### Hoare Lea is...



### Thinking about. Building intelligence.

From wellbeing to occupancy density, live and predictive building data has gone from being advantageous to vital. Better understanding and control to enhance our environments is valuable both in the short-term and as a long-term route to creating the desirable buildings of the future.

Let's talk - [StephenWreford@hoarelea.com](mailto:StephenWreford@hoarelea.com)



### Talking about. The cost of Net Zero Carbon.

The UKGBC framework definition of Net Zero Carbon in 2019 was a key step on the journey to a net-zero built environment. But the design measures required and cost impacts have yet to be fully identified. Our recent study with UKGBC investigated the design, delivery, and cost of new net-zero-carbon developments, using an office building and a residential apartment block as case studies.

Let's talk - [AshleyBateson@hoarelea.com](mailto:AshleyBateson@hoarelea.com)



### Caring about. Healthy homes.

This year has brought about a stronger appreciation in many people of the importance of a healthy home. It has also made more of us realise some of the key things we value in a home. In our recent Design Unleashed virtual event series, we explored how designers can ensure homes have a positive impact on both body and mind.

Let's talk - [MarkWilkinson@hoarelea.com](mailto:MarkWilkinson@hoarelea.com)

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

# Build back better. From rhetoric to action.



LET'S TALK  
TundeAgoro@hoarelea.com

## “Build back better” – is it an empty phrase to come out of 2020? Or can we make it a reality?

We hold many of the cards to resetting the built environment for the better. I believe we can, and should, be weaving this mantra into everything we do going forward. Not only to be led by a stronger purpose, but to acknowledge that we are an industry that needs to do better: for the planet and for people.

The resurgence of biodiversity during the worldwide lockdowns was both a wondrous and stark reminder to us all. As animal and plant life ‘reclaimed’ many towns and cities all over the globe, we were served an undeniable picture of what happens when we humans step back a little – when our man-made activities pause and give the natural world a chance to come to the fore. For many people, it was the first time they could fully process the impact we have on our fragile ecosystem. We had the time to engage with our surroundings, we cherished the outdoors, and we subsequently became more united than ever in our understanding of how vital it is to take responsible and diligent stewardship of our planet.

Many of you will have seen David Attenborough’s recent programme *Extinction*, where he stressed the importance of biodiversity as a fundamental ‘resource’ for our survival. He has since spearheaded a call for the world to invest \$500 billion a year to protect nature, highlighting the cost of continuing as usual. Meanwhile, the latest report from the World Wildlife Fund found that monitored wildlife populations have fallen by an average of 68 percent in the last 45 years. There’d be worldwide outcry if the global economy dropped by 68 percent, and we need the same level of urgency for the planet’s wildlife. This isn’t just for the preservation of our incredible natural world, but also our own human survival. Researchers have shown that the more we affect wildlife populations and cause animals to enter our environment, the more we facilitate the spread of disease-causing pathogens from animals into humans...

It’s clear there’s simply no building back better if we’re not building back holistically.



**There’d be worldwide outcry if the global economy dropped by 68 percent, and we need the same level of urgency for the planet’s wildlife.**

If our industry is to play its part, the five defined factors for sustainable development must be considered, addressed, and measured in all that we do:

### 1. Enhancing our environment.

Biodiversity protection and enhancement is a key aspect of creating ‘natural capital’ in our built environment. By intentionally re-wilding places – and ensuring buildings are designed for nature to thrive – we can help encourage better levels of biodiversity.

### 2. Reducing the impact of buildings.

Achieving net zero carbon is a global imperative. By focusing on reducing carbon emissions, designing out waste from our built environment and provision of sustainable travel (such as cycling), our industry can create healthier ecosystems for all living things – from humans to microscopic organisms.

### 3. Contributing to wider society.

Humans are social animals and are also intrinsically drawn to nature. As such, creating spaces that embrace nature is key to fostering new ways of community interaction, connection, and collaboration.

### 4. Putting people first.

By improving air quality for people, we do so for all forms of life. Re-wilding and Blue/Green infrastructure can both encourage biodiversity and benefit our health and wellbeing through a better connection with nature.

### 5. Realising commercial benefits.

Ultimately, a green recovery is vital – to not only ensure that our biodiverse planet is preserved, but because it benefits our socio-economic growth and development (both short and long-term) to work with our planet, rather than against it.

While 2020 brought about uncertainty in all its forms, one thing is certain: going back to business as usual is unthinkable and, ultimately, unsustainable. The true complexion of the pandemic has also proven to be multifaceted. Experts from Yale and the Climate Justice Alliance have demonstrated the undeniable link between environmental justice, racial injustice, and social inequality. Ultimately, “build back better” should serve as a rallying cry for how we approach many aspects of the systems – economic, social, and governmental – we exist within.

Only when our planet thrives, can all of humankind thrive. □



PEOPLE

# She's electric.

Meet the woman leading the charge into our all-electric future... **Isobel Sheldon**, chief strategy officer at Britishvolt, is at the centre of the plans for Britain's biggest battery manufacturing facility: a Gigafactory that would become second only in the world to Tesla.

Photos by Stan Papior and courtesy of Isobel Sheldon

**Q** What was it that led you into the automotive industry?

**IS** I suppose really it goes back to when I was about 7 or 8 years old and my dad was repairing his car. Like most young children, I wanted to go and help dad out, and I found myself curious about what made the car travel. As a child, the only thing I could see were the exhaust gasses coming out of the exhaust pipe so I thought they were what pushed the car down the road. My dad, being an ex-RAF engineer and technician, sat me down and talked about how an engine works and how this mechanical beast moved. I remember being horrified that we were sucking out oxygen from the air. Naively, I was worried it would use up all the oxygen needed for us to breathe. So, in a strange way, I sort of jumped on the pollution wagon at that age without even realising it. I was desperate for there to be a different solution.

I kept that early fascination for how things work, and started my career at 16 years old as an electronic technician. Later, I managed to blag my way into the drawing office for a company making great big quarry trucks and telescopic handlers, learning on the job. After various positions in design for manufacturing operations I eventually got head hunted into a role right in the heart of the automotive industry – a dream for someone like me who was bit of a petrol head at that time. While in that role, I saw the first Toyota Prius – the very first one – in Toyota’s head R&D centre in Nagoya, Japan, and it set up a train of thought in my head. Thanks to a hobby interest, I was aware of lithium iron technology being used outside of things like camcorders and mobile phones and it slowly dawned on me that this was going to be the future... but don’t forget, this was back in 2001!

**Q** Exactly, it was very early days... what gave you the confidence to dive into the world of battery technology and how did your career develop?

**IS** I mulled it over in my mind for a while and I did a bit of background investigation. Eventually I just decided to throw caution to the wind and leave my job to set up a design and development company for lithium batteries. I started with a laptop and a mobile phone and big ideas; I managed to find some capital; I went out and bought a second-generation Toyota Prius and linked up with a company in California that was doing the electronics for battery management systems. Between us, in 2004, we generated the first lithium ion powered plug-in hybrid in the world – and the first one to be sold commercially as well.

It was incredibly successful until the recession hit and so much of the funding for these kind of projects dried up. There just weren’t that many people embracing this technology back then – Elon Musk was one of them of course, but he had the benefit of \$300 million in his pocket whereas I had just £50k to work with! So, I had various roles as a battery specialist for a number of years, working as part of the executive team that got the Government-funded Battery Industrialisation Centre (UKBIC) off the ground... And now I’m at Britishvolt working on probably the most exciting project of the decade!

**Q** You’ve witnessed, and been part of, an incredibly accelerated period of change for battery technology – has that been key to keeping you inspired?

**IS** Yep, there’s been a tremendous amount of change: not just the drive down in cost, but exponential increase in the energy density (storage capacity) of batteries. I’ve seen a lot of chemistry come and go, and an awful lot of people come and go, too. Many come in thinking they are going to grab the industry by the scruff of its neck, shake it up and make it better – without really appreciating how challenging it is. I’ve said for a long time, if batteries were easy, we would have been driving electric vehicles 30 years ago!

So, it is a challenging industry... and I suppose the fact it keeps offering these challenges is what appeals to me because you will never get the perfect solution; you are always just going to be striving towards it. I think that need for continuous improvement is what has sustained me over the years. >>



**Thanks to a hobby interest, I was aware of lithium ion technology being used outside of things like camcorders and mobile phones and it slowly dawned on me that this was going to be the future...**



## What does a battery gigaplant do?

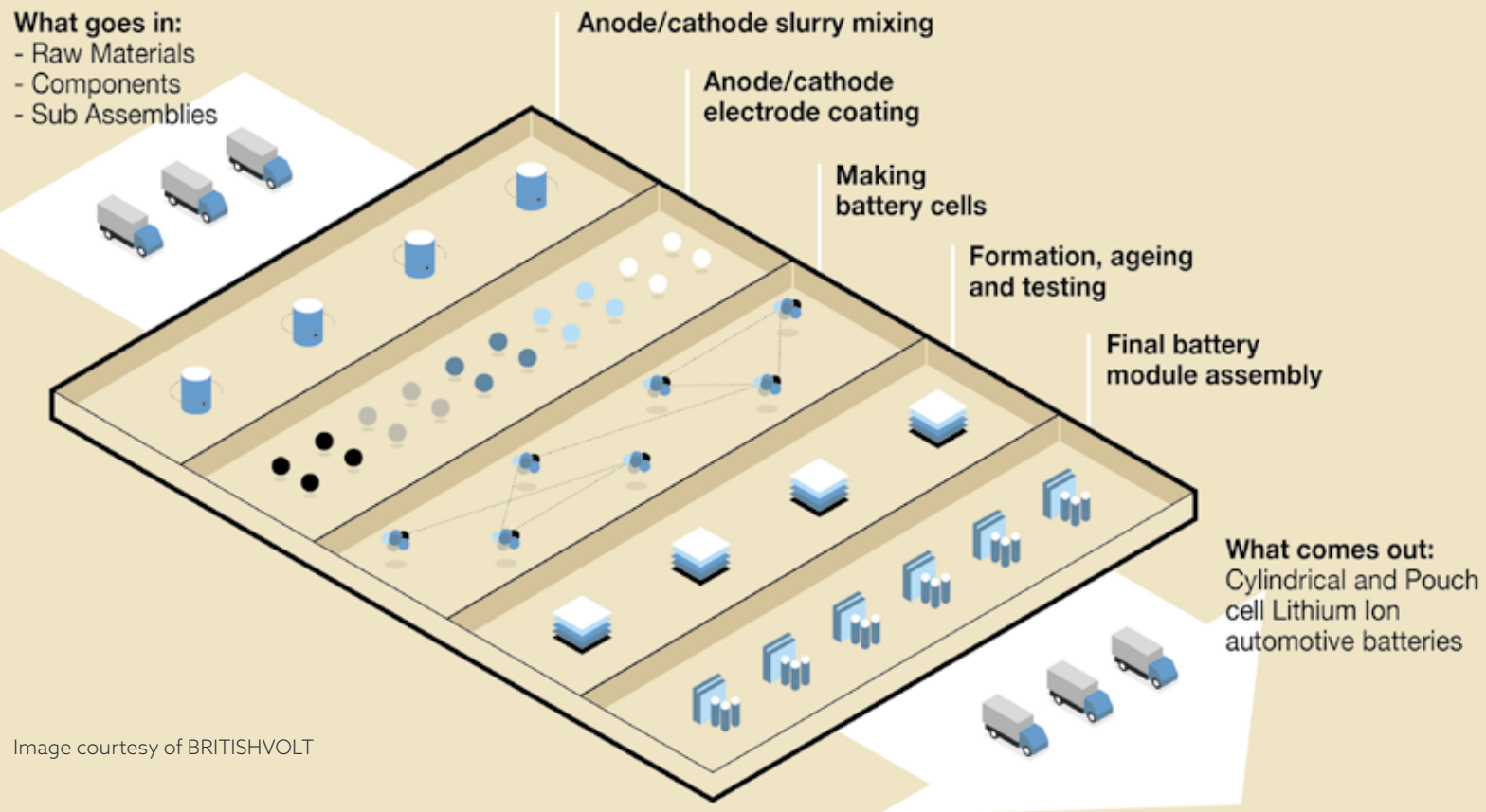


Image courtesy of BRITISHVOLT



**To have a chance to marry up the UK's automotive industry with the need to preserve the planet is incredibly special... and exciting!**

**Q** Do you think that level of accelerated change will continue for the next 10 or 20 years?

**IS** That is an interesting question. You will always have incremental improvements, but that big step change – where we make, say, a 50 percent improvement – is a little bit elusive at the moment. The best scientists around the world are spending an awful lot of brain power trying to resolve that. There is a lot of exciting research going on but, typically, new 'discoveries' (so to speak) can take between six to seven years before being manufacturing-ready. So, if we're going to hit CO<sub>2</sub> reduction targets by the latter half of this decade, all the decisions about technology need to be made now... Anything that comes along as a game changer would have to have crazy economics to justify starting again. So, essentially, lithium-ion technology is where we're going to be for the next 10 years. But as we go into the 2030s, I think those 'over the horizon' technologies will come closer to market.

**Q** Exciting stuff! The Gigaplant project is clearly going to play a major part in making this all-electric future possible?

**IS** Absolutely – it's massive... not just in ambition but scale: it's the country's second largest industrial investment in recent times and will be the 16th largest building in the world.

I like to think of it as the lithium-ion battery coming home to roost. It was Professor John Goodenough at Oxford University who invented it, and it was then licensed out to Sony and commercialised. British industry over the last 40 years has followed this trend – we're really good at inventing stuff, we just aren't always very good at manufacturing it.

**Q** Yes, there's arguably been a major disconnect between research, testing, and manufacturing – do you see that changing?

**IS** The industrial strategy in years gone by hasn't been very well joined up. I've been involved in helping academics get to their funding choices, and I think the industrial steer is what has been missing in those programmes. I see a change though... that scale up piece – that commercialisation part – is what we were missing; there was always a gap. Now, we're trying to fill it and, luckily, we have an industrial strategy that is prepared to help bridge that gap.

**Q** How do you see battery production featuring in the context of the circular economy and the move towards zero carbon?

**IS** For me, taking the carbon out of the supply chain is a critical step moving forwards. It's no good if we are building batteries for low emission vehicles if we're using industrial processes in places like China. We are just enforcing that CO<sub>2</sub> problem.

Of course, the fundamental issue is that the price expectation for those processes is set by what you can get in China. We need to level up somehow to make sure that, not just the UK but the rest of Europe too, can compete with the Far East effectively. So that zero-carbon approach must come with support for a change in how things are structured here in the UK, to make sure we can anchor not just the Gigaplant here, but also all of those significant elements of the supply chain.

We need to be much more vertically integrated, not just as a company but also as a nation and supply chain. Then you need to look at recycling and reclamation at the back end of this. There is a challenge to be risen to on that front for the recycling industry.



**The worst (or perhaps best) thing anyone can say to me is 'that's impossible' – I have to make sure I go out and prove them wrong.**

**Q** So lots of work to be done...!

**IS** Absolutely, but you know, it's going to be so good for the UK – especially our automotive industry. We all know that if battery and manufacturing doesn't take off here in the UK, the automotive industry will start to move away. It is vitally important to protect that industry and protect those jobs.

To have a chance to be part of that and to marry up the UK's automotive industry with the need to preserve the planet is incredibly special... and exciting! The worst (or perhaps best) thing anyone can say to me is 'that's impossible' – I have to make sure I go out and prove them wrong. □

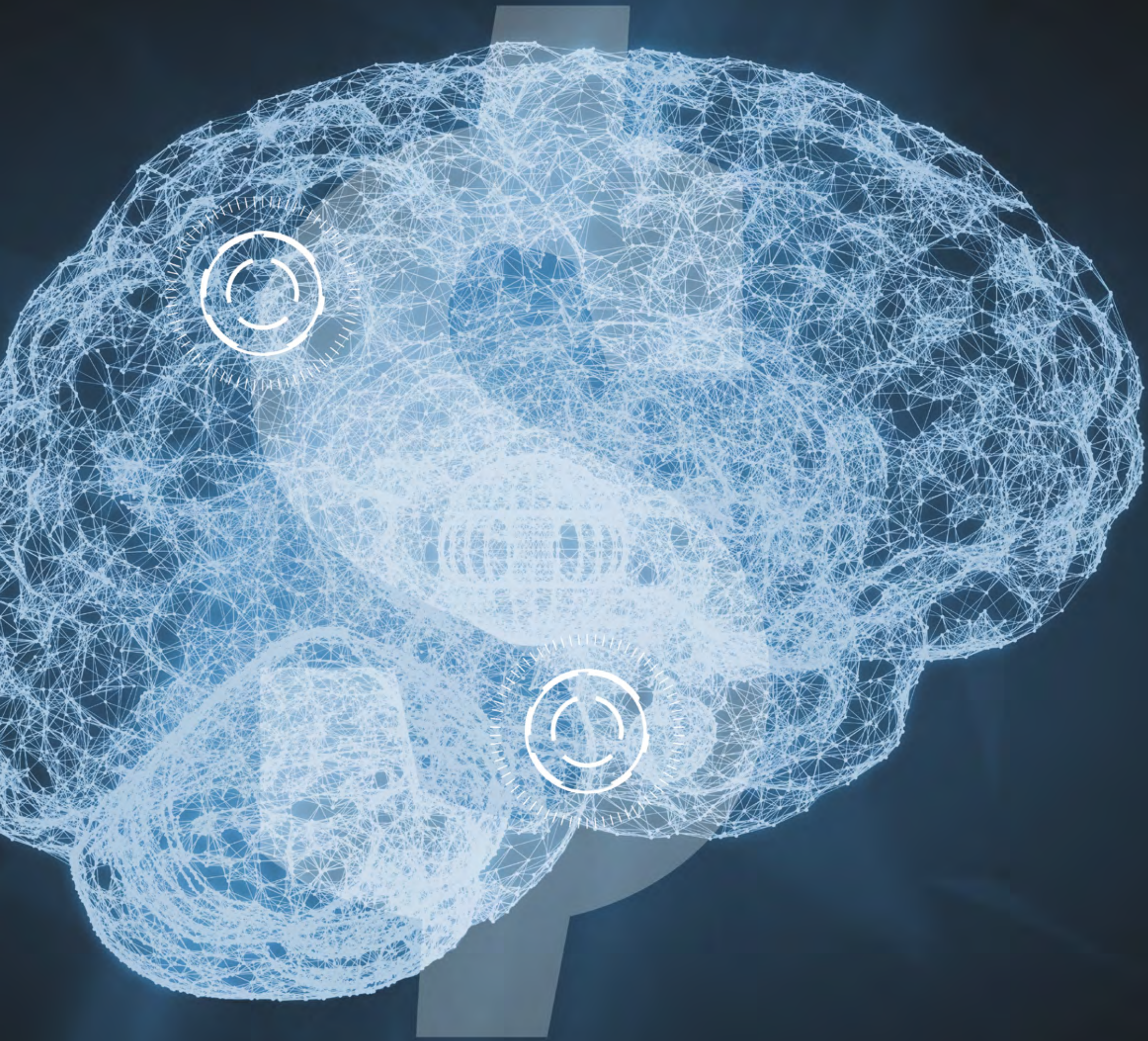


**PLACES** An exploration in blending history with world-class horticulture.

Images: Hodder+Partners. Courtesy of RHS.




RHS Bridgewater.	
The client	The Royal Horticultural Society (RHS)
The architect	Hodder+Partners
The expertise	MEP, Sustainability, Lighting Design
The challenge	Creating a sustainable 'Welcome Building' that connects to the surrounding garden, providing the perfect start and end to visitors' days.
The sector	Arts & Culture



In a recent McKinsey poll, 84 percent of global executives reported that innovation was extremely important to their growth strategies, but a staggering 94 percent were dissatisfied with their organisation's innovation performance. How and why is there such a universal struggle with this most fundamental of success factors? In the spirit of Exploare magazine, join us as we delve into how neuroscience might shed new light on this age-old challenge, and the fundamental principles that cannot be ignored...

POSSIBILITIES

# The million-dollar mindset?



**It's often cited as one of the biggest priorities – and frustrations – for leaders. Innovation, and the 'secret' to unlocking it, is a topic that both captivates and constrains. Type the word into your search engine, and you'll be bombarded with TED talks, book reviews, and business articles. There's certainly an over-simplified message conveyed that billion-dollar companies and 'disruptors' supposedly know how to innovate, and other organisations should try to imitate their success via quick tricks. Unsurprisingly however, when delving deeper than the headlines and sales pitches, it soon becomes clear there is no one method or change that can be made. Instead, by embracing better diversity, driving positive cultural change, and supporting more open mindsets, leaders can start to cultivate the shift they want to see.**

### **Mind over matter?**

When it comes to mindset, neuroscience has become a rising star in management theory on the subject. The notion or conviction that we can improve behaviour and interaction in the workplace to enhance performance, innovation, and health by understanding how our brain works is on the rise.

Research projects increasingly show that the historic focus on learning new things and building/strengthening neural connections has limited success when it comes to innovation. More important is our ability to break down old ideas (known as 'synaptic pruning'). Dr Mark Bonchek, CEO of SHIFT Academy, has spent the last decade championing a new term... 'unlearning': "In every aspect of business, we are often operating with mental models that have grown outdated or obsolete," he says. "To embrace the new logic of value creation, we have to unlearn the old one. The problem isn't learning: it's unlearning."

Unlearning is not about forgetting. It's the ability to choose an alternative mental model or paradigm. The same goes for the recently coined 'elastic thinking' by physicist Leonard Mlodinow. It champions a range of behaviours that people can better cultivate for innovation: from the capacity to let go of comfortable ideas and abandon ingrained assumptions, to reframing the questions we ask, and having a willingness to experiment and be tolerant of 'failure'.



**In every aspect of business, we are often operating with mental models that have grown outdated or obsolete. To embrace the new logic of value creation, we have to unlearn the old one. The problem isn't learning: it's unlearning.**

Dr Mark Bonchek

### **Where do ideas come from?**

#### **It's all about connections**

In humans, about three quarters (far more than any other animal) of our cerebral neurons reside inside the 'association cortices'. Our association neurons are what allow us to think and have ideas rather than merely react... Studies have shown that increased neural connections (association) is where ideas come from – put simply, it's the brain connecting something that it hasn't ever connected before. Ideas form when information and thoughts collide – the result of minute interactions of billions of networked neurons.

"What's interesting is that the genesis of innovation isn't the result of a Eureka moment," says Andrew Bullmore, Partner and Head of Innovation at Hoare Lea. "It's fascinating to think that it's often a collision between smaller hunches. They then become more than the sum of their parts when we connect them together and develop those thoughts further."

### **The brain's own barriers**

There are a multitude of influential factors on an individual's thought processes, and job type is included in this. We each develop a point of view on common issues during the first few years in a role – the 'prevailing wisdom' of the industry, employer, or even team becomes the norm in our brains. This, combined with the likely dominance of our analytical left brain (something common for most people), often means it becomes harder and harder to see 'outside the box'. We have to push ourselves to naturally innovate, or to ask new questions rather than just answer old ones.

Researchers have shown that this 'dogmatic cognition' (often referred to as frozen thoughts / accepted truths) is so strong in most humans that our brain can actually reject non-confirming facts even when there is evidence for them. This isn't stupidity at all – indeed, the irony of frozen thinking is that it's a particular risk when you're an expert in something.

Added to this, the longer we are influenced by societal norms, the more our brains learn to moderate anything 'irrational'. As a child, your desire to live in a house made out of sweets is perfectly acceptable to say with absolute seriousness; when you're a grown adult it can only be said jokingly. >>

Photo by Eugenio Mazzone on Unsplash

## Diverse thinking.

The 'dogmatic cognition' barrier is similar to a brain behaviour called 'functional fixedness'. It's a manifestation of a larger issue with the way our brains work: they essentially deal with unfamiliar situations through 'momentum of thought'. This means that once our conscious is set in a direction, it typically continues with that one thread even if it is fruitless. (A simple example of this is looking at a word jumble and only being able to think of one incorrect solution). Scientists have found that a new or changed situation can provide the 'force' needed to change momentum of thought (i.e. just moving to a new room could make a problem easier to tackle). Anecdotal interviews tell of people making life-changing decisions when something dramatic happens in their lives or they travel to a new place. Essentially, when our brains encounter different situations, we become more open to new ideas.

But not all of us have the same fixedness.

In Leonard Mlodinow's book, *Elastic: flexible thinking in a constantly changing world*, he touches on a pioneering study. It showed how, when faced with a challenge where the solution was to use items in a different way than they're supposed to be, ¾ of adult groups fail; yet children performed much better... as did members of an Amazonian tribe.

An essential part of the all-important wider diversity and inclusion movement is ensuring differences in thinking. Cognitive diversity – which includes diversity in ideas, viewpoints, and problem-solving approaches – plays an integral role in opening up new perspectives. By broadening the mix of people with a range of social, ethnic, and economic backgrounds and identities, organisations can not only be more inclusive and representative of society, but also promote cognitive diversity, thereby addressing challenges with a broader range of questions, approaches, and perspectives.

An experiment run by the Harvard Business Review found that teams with a high deviation from a 'standard' perspective (in other words, cognitive diversity) are more likely to solve a problem than non-diverse teams. Similarly, a Deloitte report found that cognitively and demographically diverse teams can enhance innovation by 20 percent and identify/reduce risks by up to 30 percent.

"Everyone brings different experiences, cultural viewpoints, and identities into the workplace," says Andrew Bullmore "These should be celebrated and valued, especially as a key aspect of successful innovation."

"I also believe in the need to better engage with the next generation – people who will automatically think differently to how we do now. That's something that needs to be encouraged rather than stifled. By championing how future engineers, designers, and building occupants view the importance of their homes, schools, workplaces, and infrastructure on the wider environment, it's possible to set up a powerful 'chain of natural changemakers'." >>



**Everyone brings different experiences, cultural viewpoints, and identities into the workplace. These should be celebrated and valued, especially as a key aspect of successful innovation.**

Andrew Bullmore Partner and Head of Innovation, Hoare Lea



Photo by Dmitry Ratushny on Unsplash

## Want to improve your elastic thinking?

**"Within each of us are two distinct thinkers, both a logician and an associator. These two thinkers are competitors – out of whose struggle our thoughts and ideas emerge. We can all switch between modes of brain function that 'spontaneously' generate ideas and those that scrutinise them. The trick is being able to shift between these two modes when we need to. The latest findings in neuroscience and psychology give us the tools we need to make ourselves better elastic thinkers. Nurturing your ability for elastic thinking can help you generate new ideas. Some (many!) will prove useless, while others will culminate in the innovative solutions required for the problems of today."**

Leonard Mlodinow

Over eight weeks, regularly try:

- **Stepping outside your box** – putting yourself in situations you wouldn't usually be in.

This is about absorbing different information into your unconscious, which will help build associations that you wouldn't otherwise get.

Example: actively strike up conversations with people you would usually never dream of talking to, pick an activity that wouldn't typically occur to you to do, or explore a subject/skillset that you believe doesn't play to your strengths.

- **Practising remote associations and riddle solving** – training your brain to reach the 'aha' moment and problem solve in a new way.

In trials, people who do exceptionally well on these activities report that they are 'letting their mind wander' rather than working through options.

Example: remote association tests, such as trying to find the connecting word that works when paired with three or more words: ie pine, crab, sauce. (The answer is apple.)

- **Actively 'switching off'** – letting your unconscious dominate more often.

The demands of daily life mean we hardly ever have time to just let our minds wander; most of the 'down time' we get is spent listening to music, podcasts, or just holding things in our brains (such as "I need to remember to take the bins out tonight").

Example: write down everything you're 'holding in your head', set alarms so you don't have to stay present, take a walk, shower, or lie in the dark, but do not take your phone with you!



## From STEM to STEAM.

It's this next generation that have also experienced first-hand the benefits of more cognitively diverse learning models. Adding the 'arts' perspective to science, technology, engineering and mathematics (STEM to STEAM) subjects is the most prominent. It involves looking at the world or a challenge through a different lens (usually the culture, capabilities, and motivations of people) to better contextualise those subjects. STEAM activities are typically hands-on, which often takes some of the pressure off students, and are designed to use both the brain's 'analytical' left hemisphere and the 'innovative' right hemisphere when approaching problems.

Photo by Joshua Rawson Harris on Unsplash

## A question of culture.

Of course, both mindset and diversity unavoidably intersect with culture. Increasing the ability of an organisation to innovate is not an individual feat. While understanding how the brain works through neuroscience can improve a person's ability to think differently, and more diverse teams will naturally do so, both these factors will always be affected by a culture that either fosters, stifles, or shapes innovation.

In 2018, neuroscientific and cultural perspectives were integrated into a coherent narrative for the first time. *The human brain in the age of innovation* by Elkhonon Goldberg demonstrated that even neuroscientists are beginning to acknowledge the two are intrinsically linked.

As Andrew notes: "To continually develop solutions to internal and external drivers requires a lot of resource, hard work, and sustained attention. Innovation has to be embedded within culture, historical successes, creative diligence, and collaborative practices. An innovation week or an innovation programme to generate ideas will only take us so far. Successful innovation is the result of the evaluation, prioritisation, and implementation of ideas – and a culture dictates which ideas are condoned or tolerated, and those that aren't given serious consideration.

"Most importantly, a successful culture is not about innovation for innovation's sake, but instead being committed to unlocking value (whether that be social, economic, environmental and so on) through innovation in a responsible and effective way."

Looking inwards at organisations, there are many cultural questions that can be asked... Which ideas are deemed inconceivable or too risky? Are some dismissed because they came from the 'wrong' person? Do things slip through because they are presented in a way that diverges from a conventional process? How free do people feel about speaking out on a new way of doing things, even if it's far from being thought through? It's so easy to kill an idea but infinitely harder to defend it. Is there a culture of supporting people in taking things further? How is feedback given and received? How are mistakes and 'failure' communicated, and positively learnt from?

Of course, ideas should be challenged. However, it's vital that they don't fall victim to internal conflicts, deafening silence, or actual suppression. Biases and prejudices have an incredible unconscious impact on how we perceive ideas. Ultimately, an organisation's success at innovation depends on how ideas are collected, evaluated, and progressed. Like so many things, it's clear culture is at the core. □

### LET'S TALK

AndrewBullmore@hoarelea.com



**By championing how future engineers, designers, and building occupants view the importance of their homes, schools, workplaces, and infrastructure on the wider environment, it's possible to set up a powerful 'chain of natural changemakers'.**

Andrew Bullmore Partner and Head of Innovation, Hoare Lea

Photo: Plymouth City Council

The Box, Plymouth.	
The client	Plymouth City Council
The architect	Atkins
The expertise	MEP
The challenge	The modernisation of a Grade II listed building into an innovative, interactive history centre, featuring energy-efficient close-control environments for historical artefacts and exhibitions.
The sector	Arts, Culture & Heritage



Former F1 champion Nico Rosberg did not retire from racing at the peak of his success for nothing. He did it for a cause bigger than himself – and, indeed, bigger than us all. Determined to inject energy, excitement, and enthusiasm into green tech and its role in tackling the climate emergency, he is now arguably carving out an even more respected reputation off the track...

**Nico Rosberg**

# Driving force.

Photos courtesy of Nico Rosberg.



**One of the hardest transitions for sports people is stepping down from the stage. When is the right time? Where do you put all that competitive drive? How do you re-direct the skillsets developed through decades of discipline and focus? What's the key to staying energised and motivated?**

These are tough questions for anyone – but, happily, it seems Nico Rosberg has found his answers.

In 2016, just five days after clinching the Formula One World Championship title, he announced his retirement from motor racing. With this surprise decision to walk away while at the top of his game, did he demonstrate to the world that there's more to life than competition?

"I suppose I'd learnt so much about human needs and about myself while racing," he explains. "When I won the world championship, I'd achieved what I'd spent so long aiming for, so it was time for a change. I needed to keep giving myself challenges."

### **An engineer's mindset**

This newfound challenge manifested itself by Nico looking both to the future (seeing the need for a more sustainable model of business) and drawing on his past passions and talent: in particular, engineering.

Known as an exceptional racer not just for his skills on the track, but his deep understanding of F1 engineering, Nico achieved the highest score ever in Williams's Engineering Aptitude Test. In fact, before racing professionally, he was set to study aeronautical engineering at Imperial College London.

"I suppose I've always been interested in engineering, even from a young age. When I was competing, it drew my interest because I understood that by grasping the engineering side of motorsport, I was only going to become quicker.

"I remember visiting the Mercedes factory in Brackley. I felt it was so important to understand the process and development being done on the car. Professional sportsmanship is all about being consistent in your application and persistent in your drive to become better. The same qualities relate to engineering: how can you refine the process? What's holding you back and how do you find the solution? How do you ensure you remain focused and driven 100 percent of the time to achieve your goals?

"Nowadays, of course, my interest in engineering is more to do with smart mobility solutions that drive sustainability and refine the way society gets from A to B."

Indeed, Nico's move into the world of sustainable entrepreneurship and green tech is something that draws on his racing skillset: "Throughout my racing career I had the opportunity to work in incredible teams with some of the best engineers on the planet. What engineers and mechanics are great at – and this is particularly true in F1 – is being problem-solvers whose passion is helping people get the most out of something. It's that same passion I see in the sustainability experts I work with: they're assessing today's environmental issues and the problems they might cause tomorrow, and then reacting with the best possible solutions."



**What engineers and mechanics are great at – and this is particularly true in F1 – is being problem-solvers whose passion is helping people get the most out of something. It's that same passion I see in the sustainability experts I work with.**

### **Festival spirit**

In 2019, Nico co-founded Greentech Festival in Berlin, aiming to unite a global community of innovators and change-makers. 2020's event saw the likes of Google, Audi, NIO, Volocopter, and more take part to raise awareness and signify their commitment to driving society forward in a sustainability-conscious manner.

"The festival is really about hope, possibilities, and ideas for a sustainable lifestyle," says Nico. "We're celebrating and advancing the technologies that will make our future lifestyles possible. Our aim is to bring the enormous potential of green technologies to life. We're at a critical point in our lifetimes where the need to adopt sustainable solutions to facilitate our everyday lives is crucial. It's these technologies and the way in which they are adopted that will make the biggest difference in protecting our planet and helping achieve environmental goals, such as the EU's 2030 & 2050 climate targets, and help support the great work of leaders such as Christiana Figueres, the founder of the UN Paris Agreement.

"We've seen a huge global shift in momentum, commitment, and attitude to green technology in recent years by business, sport, and society. One of the biggest challenges is how we shift the consumer mindset and not just showcase smart solutions but also demonstrate how they can integrate into everyday life. I firmly believe that if we inspire and captivate as many people as possible around the world, we can help accelerate the positive change."

One of the areas in which Nico is particularly well-equipped to inspire and captivate people is Formula E, the global motorsport championship that permits only electric cars. As an early investor in Formula E, he's seen it grow from a motorsport start-up into an FIA-approved World Championship. In 2019, just five years after the series launched, Formula E was valued at \$1 billion. >>







Formula E

**Being a part of the growth of the sport and its impact on people's perceptions of electric vehicles has been amazing. I'm confident it will continue to grow further.**



"Being a part of the growth of the sport and its impact on people's perceptions of electric vehicles has been amazing," he enthuses. "I'm confident it will continue to grow further. The racing is great, too - I'd encourage anyone to watch it! I think we're making very good progress with not only electric cars but hydrogen-powered vehicles, which will ultimately be the perfect form of propulsion in the future. It's true that hydrogen power has its challenges in terms of storage and cost of development, but it has so many promising potentials."

### Taking off

It's clear Nico is truly excited by the advances being made in the world of green mobility and he can't wait to see what the next few years hold for vertical take-off and landing (VTOL) aircraft in particular. A VTOL aircraft is one that can hover, take off, and land vertically, such as helicopters and small drones, right through to military jets and - wait for it - flying taxis. VTOL technology means aircraft can theoretically take off and land almost anywhere, making them far more flexible - and, more importantly, they're powered by electric motors. With Uber recently unveiling plans to launch these 'flying taxis', you might want to bet on them being the buzzword of 2021, and they'll likely be a major part of our future smart cities.

"One of my big passions is VTOL aircraft," explains Nico. "It's great to see the industry moving closer to becoming commercialised. I'm working with Volocopter whose technology will see VTOL transportation become a reality. The real value, alongside the climate benefits of course, is that this kind of technology will help to democratise flying, reduce costs, and provide flexibility when it comes to green travel. I've already received my ticket for the first air taxi flight and can't wait to see others around the world do the same in the coming months."

Nico now sits as a sustainability investor on *Die Höhle der Löwen* (the German edition of *Dragons' Den*): "I've had a lot of fun being a dragon in Germany! It's fascinating to see some incredible companies coming through and doing so well thanks to the show. My own area of expertise is in green investment, and I'm looking forward to supporting the best of those sustainability-focused projects as they come through."



### VTOL aircraft

**The real value, alongside the climate benefits of course, is that this kind of technology will help to democratise flying, reduce costs, and provide flexibility when it comes to green travel.**



Like any great champion of a global cause, Nico's visceral excitement is resonating with more and more people, and support for green start-ups is gathering momentum. The communication skills needed to cut through conventional expectations and ways of doing things is immense, but it's something he believes we've all got better at this year.

"Communication has never been more important than in these recent tough times where, so often, we haven't been together in the same room with the people we interact with. I think we've all learned to communicate better. Particularly for me, as someone who was often away travelling for work, having quality time with my two daughters and wife has been such a gift. We have had some really special moments, whether it's home-schooling them or teaching them about sustainable practices, and growing fruit and vegetables in our garden.

"The pandemic has, in some ways, helped to make both governments and individuals focus on the need for accelerated change. We have all had the opportunity to see and experience the benefits of not just quieter cities but much cleaner cities too - but there's still frustration in getting the powers that be to understand how urgent this issue is. Ultimately though, I'm certain that, collectively, we have realised we need to care more for the environment and also each other too." □



**River South, Austin.**

The client	Stream Realty
The expertise	Intelligent Buildings
The challenge	Designing advanced intelligent systems to create a user-centred building that can adapt and seamlessly blend future technology.
The sectors	Mixed-use, Workplace



Partners Matt Jones and Miles Freeman share some of the pioneering spaces we're helping to shape across the Arc.

LET'S TALK  
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 MilesFreeman@hoarelea.com

**1**  
**Jaguar Landrover.**  
**Automotive advancement in Warwickshire.**

Jaguar Land Rover (JLR) is majorly redeveloping its HQ at Warwickshire's Gaydon site. With an ambition to create a high-performance sustainable centre for engineering, creative inspiration, development, and collaboration, the +\$600 million investment has also led to major community growth in the local area. We have supported a variety of development projects, from the new purpose-built Research, Development & Technology Centre, to a Design Model Operations extension and Vehicle Testing facility. The JLR vision is for a world in which zero-emission vehicles, public transport, and self-driving pods will form one smart integrated and networked transport system, and all development projects are designed with a 'Destination Zero' approach.

**2**  
**Beecroft Building.**  
**Quantum computing in Oxford.**

Arguably, the most exciting and transformative breakthrough of the 21st century will come from the world of quantum computing. The race is on to develop useable machines. Without doubt our most challenging project to date, the Beecroft Building is one of the world's most demanding facilities, and is where quantum computers are being developed. We designed the near-impossible close-control climate systems needed alongside the ambitious vibration-control targets and use of low and zero carbon technologies. As the physics department's first new building in 50 years, it's now equipped for cutting edge science in the 21st century. Housing some of the brightest minds from across the world, we are proud to have played our part in creating this transformative building.

# Shaping UK innovation.

## The Arc.

**HOARE LEA & THE ARC**

Fundamental to the Government's industrial strategy, the Arc is about creating the UK's version of Silicon Valley. Stretching from Reading and Milton Keynes to Oxford and Cambridge, new and repurposed developments will enable an 'arc' of innovation to drive the UK's growth. Drawing on our decades-long experience of designing cutting-edge projects that have given the Arc its strong foundations, we have already started to enhance, grow, and connect this innovation ecosystem.

**3**  
**National Satellite Testing Facility.**  
**Space exploration in Oxfordshire.**

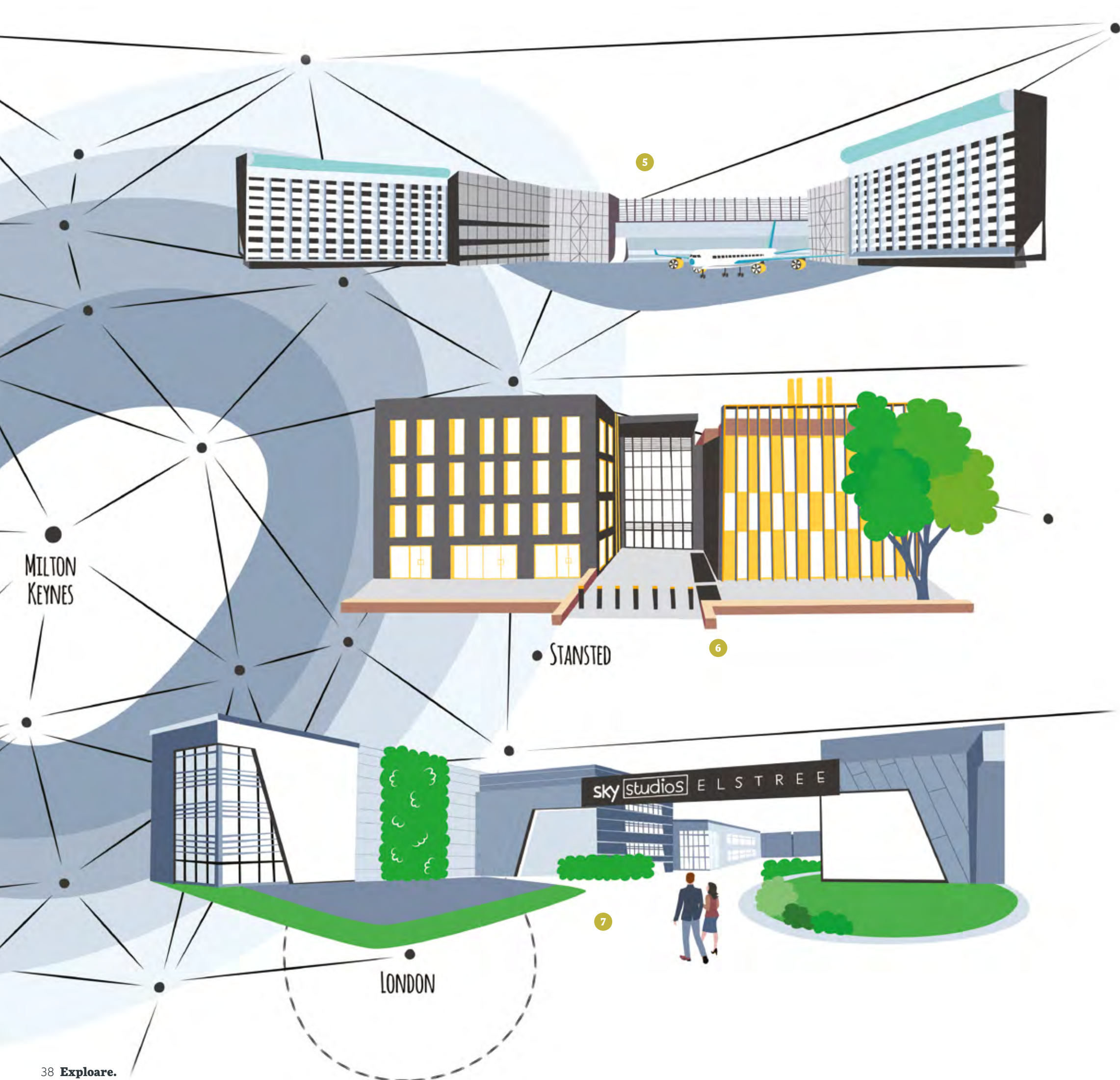
The UK's National Satellite Test Facility (NSTF) is an incredible project that forms part of the next phase in the UK's space capability expansion. Alongside laboratory and workshop spaces, the bespoke development is capable of accommodating space craft that weigh seven metric tonnes. Housing one of the largest thermal vacuum chambers and dedicated clean rooms in Europe, the facility will allow for a range of

tough test conditions that replicate the launch and lifecycle conditions of a spacecraft. We worked closely with RAL Space, resolving the unique challenges of this complex project. By independently containing the spaces for vibration and acoustic testing, electromagnetic compatibility, centre of gravity testing, and pyroshock simulation, we were able to ensure two satellites can be tested in parallel within the building. We can't wait to see this pioneering facility for the UK space industry open its doors in 2021.



# Shaping UK innovation.

## The Arc.



4

### Rosalind Franklin Institute.

#### Life sciences in Oxfordshire.

The Rosalind Franklin Institute (RFI), will be a national centre of excellence at the Harwell Campus that will harness disruptive technologies such as AI and robotics to boost our understanding of biology. It's one of the best examples of government, academic, and commercial collaboration. The building will serve a range of universities working alongside the Science and Technology Facilities Council (STFC), which is an independent organisation funded by the UK government through the Engineering and Physical Sciences Research Council. This unique building (with a design that draws upon the motifs in Rosalind Franklin's x-ray diffracted DNA images) will unite industry experts with university researchers to embrace high-risk, adventurous research that will transform the way the UK develops new diagnostics, therapies, and medicines.

impact of the testing noise to the lowest possible levels. We used complex noise analysis techniques to calculate and predict potential spread of noise under different weather conditions. By developing a specialist software application, we were able to demonstrate the noise levels to the local authority and community, so that people and key decision makers could be reassured. After planning permission was granted, we were then re-commissioned to undertake a highly involved process of acoustic testing to confirm that this state-of-the-art installation was compliant.

6

### ABCAM global HQ.

#### Biomedical advancement in Cambridge.

This global headquarters in the centre of the Cambridge Biomedical Campus will help ABCAM write the next chapter of its Cambridge success story. At the heart of the move to the Biomedical Campus is collaboration, as it's the largest life sciences research hub in the whole of Europe. This ethos of collaborative working mirrors our own. Throughout the project, our engineers worked closely with the various groups within ABCAM to create spaces that are specific to their needs, but importantly, are agile enough to ensure future flexibility. By developing a bespoke sustainability strategy in partnership with Cambridge City Council, we were able to exceed the planner's sustainability targets, all while maintaining affordability and enhancing the key features of this state-of-the-art people-led project.

5

### Cambridge Airport Ground Run-up Enclosure.

#### Aircraft engine testing in Cambridgeshire.

This new aircraft engine testing facility at Cambridge Airport is one of the most advanced facilities globally. The main aspect is the world's largest four-sided Ground Run-up Enclosure (GRE), which reduces the

7

### Sky Studios.

#### Digital creativity in Elstree.

The Sky Studios Elstree project in Hertfordshire is set to create a 32-acre TV and film studio that acts as a world-leading production hub. It's a testament to the rapidly blooming film industry in the UK, as well as the need for more high quality, original content to be created. Owned by Legal and General, the underutilised greenfield site on the edge of Borehamwood presented an opportunity for sought after studio space. Although the planning application was submitted early in the process, our specialists undertook front-end design in parallel. Not only did this improve confidence in the accuracy of the planning information, but will also make for streamlined detailed design as the project progresses. The new studio space will also play host to some incredible film productions from Universal Pictures, Focus Features and Working Title, and television series from NBC Universal Content Studios. Forecasted to create up to 2,000 jobs in the local area, it's a huge opportunity for the UK creative industry... exciting times!

Illustration: Bek Cruddace, Hampshire

TWO EXPERTS: ONE BELIEVER - ONE SCEPTIC

# X files: Do we need to accelerate the transition to timber buildings?



## The believer.

**WILL BELFIELD**  
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The climate emergency we're facing has brought to light the importance of a faster adoption of engineered timber in construction. Mass timber has major sustainability, aesthetic, wellbeing, and programme advantages – and, amazingly, offers a similar structural strength to concrete despite having a much lighter mass.

As the grid decarbonises, the proportion of emissions from building operations will diminish and embodied emissions will take precedent. The best place to start in reducing this embodied carbon is within the structure of a building as it represents roughly 50 percent of the total emissions.

If cement (the primary constituent of concrete) was a country, it would be the third largest carbon dioxide emitter in the world. By comparison, timber is classified as a renewable material, and the carbon emissions released during the processing and production are low.

Timber is lighter than typical construction materials, which is great for existing buildings as a timber roof extension is the most carbon-effective solution to deliver new floor space.

Yet perhaps the most significant benefit of timber is its ability to store carbon. Taking this sequestered carbon into consideration, timber buildings become key to delivering net-zero-carbon buildings: in a fully timber structure the reduction in upfront carbon compared to a conventional building could be as much as 60 percent.

## Circular design

Timber has major circular economy benefits and CLT in particular lends itself to modular construction and designing for disassembly. Added to this, the more we promote the use of timber and drive demand, certifications such as FSC and PEFC mean further forest growth will occur to maintain the supply – subsequently creating more carbon capture.

We have a vital responsibility in our industry to meet the net-zero-carbon goals of 2030 and 2050 respectively. Is mass timber's current use as widespread as it should be, given all its advantages? The answer is a resounding no. Ultimately, timber is a key route to the climate-conscious buildings of the future... the transition can't come quick enough.



## The sceptic.

**LOUIS CHAUMONT**  
LouisChaumont@hoarelea.com

Mass timber clearly has a huge role to play in delivering the net-zero-carbon built environment we need. However, there are a number of key challenges in delivering mass timber buildings – both at scale and cost effectively – that the industry is currently working hard to overcome. It's clear we should be transitioning to them as soon as we safely can, by increasing confidence and knowledge within the industry.

A key factor to be aware of is that there could be issues with the supply chain if the use of timber were to expand too rapidly. Therefore, it should be noted that timber cannot get us to a net-zero future alone; it must be accompanied by the transition of other core structural materials, for example, net-zero-carbon steel.

Yet the main area of importance is to fully understand fire behaviour in such buildings. Engineered timber has so far been used mainly for low-rise residential, commercial, and mixed-use buildings. Now, as new technologies and awareness improves, architects and developers are beginning to propose high-rise buildings constructed with CLT. However, this creates a level of complexity when it comes to fire safety, due to the additional fire loading compared to traditional buildings. Added to this is the fact that, due to the engineered timber's composition and behaviour in fire, the standalone assumption of using the charring rates doesn't allow us to achieve an adequate level of safety.

As such, alternative fire engineered solutions need to be explored to ensure that mass timber buildings can withstand a compartment burnout. The impact of mass timber elements on other aspects of a fire safety strategy also need to be assessed, including: internal fire spread, vertical fire spread over the façade, or external fire spread to neighbouring buildings.

There is currently no guidance available in the UK to base the design of large mass timber buildings on and meet these objectives. Thankfully, through performance-based design and fire testing, we can ensure that the functional requirements of Building Regulations can be met. So while these materials present an additional level of complexity when it comes to fire safety, it's a challenge we can easily overcome with the right level of understanding and expertise. Ultimately, this transition is needed as soon as possible to create innovative sustainable buildings that are safe for their occupants.

Photo by banternaps, Unsplash

# Compassion and connection.

## Design for togetherness.



Image: Scott Brownrigg

One of the many emotional challenges Covid-19 sparked was the disconnection and loneliness that can come from physical isolation. The Social Contact Pod is one of the ways the design industry has stepped up to the challenge of finding ways to safely connect vulnerable people with loved ones in person.

### Associate Architect, Scott Brownrigg Felicity Meares:

"If there are a few silver linings to lockdowns, one is certainly how we no longer take for granted human connection and face-to-face interaction, especially when it comes to our loved ones. But while many of us were able to slowly return to in-person meet-ups before the second national lockdown, it wasn't the case for the most vulnerable in our society. Whether through illness, age, or disability, thousands across the country remained isolated in care homes, hospices and rehabilitation centres, to protect them from contamination.

"Back in March 2020, our Design Research Unit diverted all its efforts into exploring how we respond to and limit the spread of epidemics in the built environment, as well as calling on others within the profession, academia, and research world to do the same.

"One of the immediate challenges that came out of our discussions was how we could help people enjoy that much-needed physical connection with vulnerable loved ones, without the risk of contamination. Incredibly quickly, the Social Contact Pod concept was born. We designed a lightweight timber pod that can be rapidly constructed and easily transported to wherever it's needed, whether that's a care home, hospital carpark, or garden. That all-important human contact and hand holding is made possible via a plastic membrane set into a Perspex partition that separates each group.

"By working in collaboration with Ramboll, and Hoare Lea's M&E and sustainability specialists, the pods are off-grid and can be easily repurposed or recycled. With high chances of future new viruses spreading through residential care homes, it seems solutions that can avoid any periods of isolation and loneliness for the most vulnerable in our society are more important than ever." □

#### LET'S TALK

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#### DISCOVER MORE

[scottbrownrigg.com/work/projects/the-social-contact-pod](https://scottbrownrigg.com/work/projects/the-social-contact-pod)

#### Engineers of human experiences

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, Glasgow, Leeds, London, Manchester, Oxford, Plymouth, Madrid (associated office).

#### Expertise

Acoustics, Air Quality, Audiovisual, Digital Engineering, Environmental planning, Expert Witness, Façade Access, Fire Engineering, ICT Services, Intelligent Buildings, 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.**  
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Challenge accepted.

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## Exploare.

A DRIVING FORCE FOR GOOD WITH NICO ROSBERG

BRITAIN'S BATTERY BOOM WITH ISOBEL SHELDON

THE SOCIAL CONTACT POD WITH FELICITY MEARES

SHAPING UK INNOVATION WITH THE ARC TEAM

BUILDING BACK BETTER WITH TUNDE AGORO

THE INNOVATION MINDSET WITH INDUSTRY EXPERTS