

Exploare

The future belongs to the curious.

A magazine from Hoare Lea



A glowing jellyfish with a complex, fractal-like internal structure. The jellyfish is primarily blue and purple, with a bright, glowing core that resembles a fractal or a complex, organic pattern. The background is dark, making the jellyfish stand out.

The future belongs to the curious.

**“Whatever you can do,
or dream you can, begin it.
Boldness has genius, power
and magic in it.”**

Johann Wolfgang von Goethe

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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.

Whether it's stepping into the unknowns of the cosmos or challenging environs in humanitarian design, exploring research frontiers, reshaping an energy sector in crisis or claiming space and finding a voice in a newly accessible field...

It's about boldly going.

Letting go of the limitations that police our capacity for creativity and innovation allows us to discover work-arounds and break down barriers.

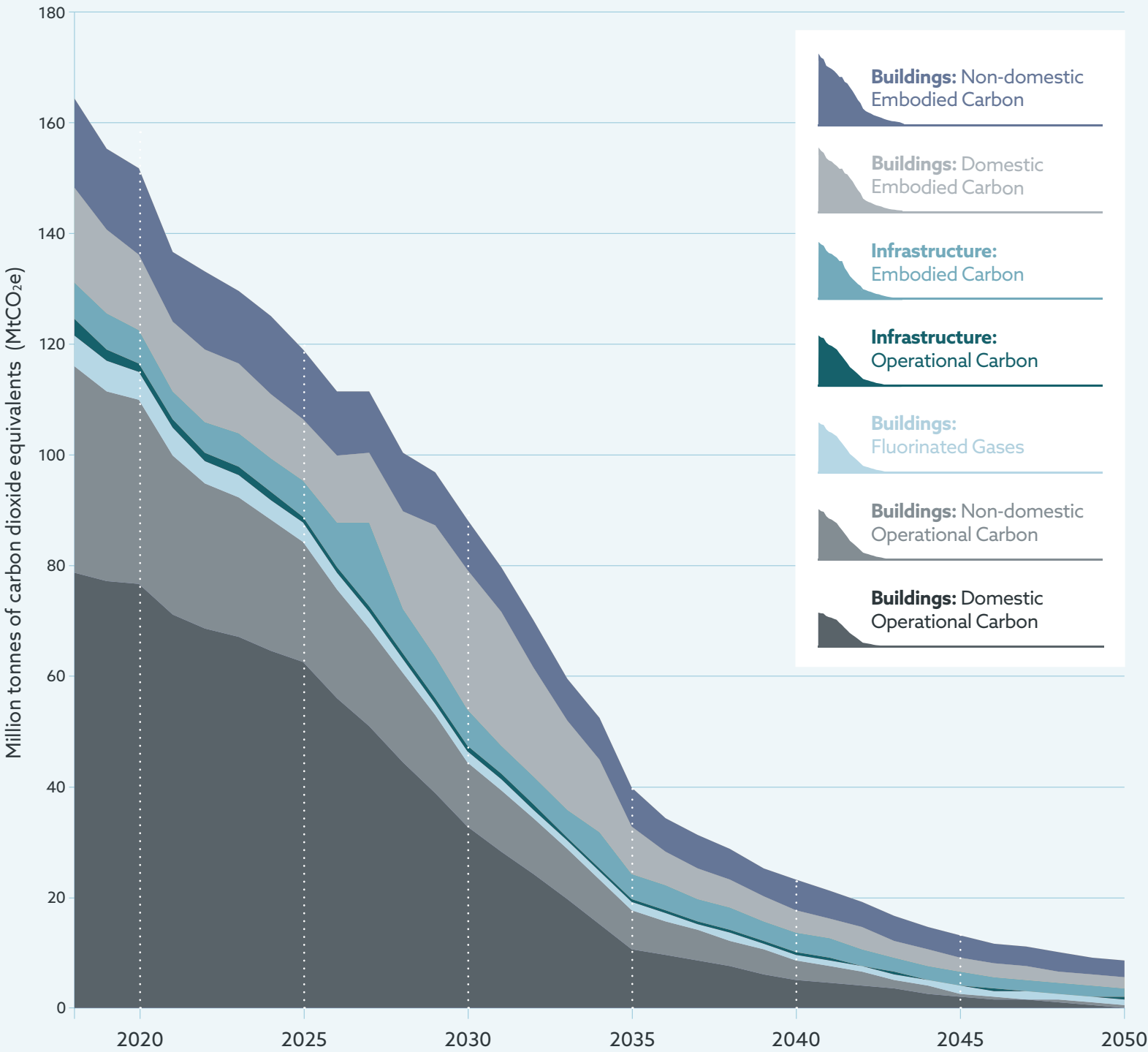
Sculpting our future requires us to carve out room to think and to dream; to step outside the everyday where, often, blue-sky thinking can be optimised out of existence, with no place on the balance sheet. We must pencil it back in – in permanent marker.

After the thinking and talking, comes the doing, and disrupting the status quo to steer in a new direction and facilitate positive growth is no mean feat.

To meaningfully achieve it, we must be holistic; working together, sociably. Not pigeonholing ourselves. We're all connected, and when the fine detail of the specialist and the overarching perspective of the generalist combine, there is great power, value and trickle-down of transformation.

Be it space, sport, science, security, sustainability, social justice. Let's go – with dreams, with ideas, with design – where nobody has gone before.

The trend report.



On the radar.



1.

METERING AND BILLING SOON ENFORCED
By September 2022, recent amendments to the heat network metering and billing regulations will be legally enforceable and appropriate metering needs to be installed. The regulations cover residential, commercial, industrial, and public sector networks across the UK.
Let's talk - ZygiKadziulis@hoarelealea.com

2.

MINIMUM ENERGY EFFICIENCY STANDARDS
The Minimum Energy Efficiency Standards (MEES) are expected to require landlords to upgrade their buildings to EPC rating C by 2027 and EPC B by 2030. This is part of new energy performance regulation proposals, intended to reduce buildings' energy usage by 30%.
Let's talk - SteveRogers@hoarelealea.com

3.

NATURE-BASED INNOVATION CHALLENGE
The UKGBC set two innovation challenges for nature-based and climate-resilient solutions for the built environment. An industry judging panel assessed the practicality, immediacy and impact of each solution, with a report released detailing the winners.
Let's talk - RobertWinch@hoarelealea.com

4.

ESCAPE ROOMS GO DIGITAL
Why upskill engineers in BIM 360 the usual way when you can use gamified learning techniques instead? Our BIM360 escape room has been shortlisted for the Digital Excellence category at the Digital Construction Awards.
Let's talk - NissaBurrell@hoarelealea.com

Conversation kickstarter.

“ICT is changing how we do things as a society; it is transformative and it should be helping us manage climate change...”

Professor Adrian Friday,
Computing and Sustainability,
Lancaster University

“We have got an ever-increasing ecosystem of innovation in the city, where connections are getting easier to make.”

Professor Michele Barbour,
Associate Pro Vice-Chancellor for Enterprise and Innovation, University of Bristol

Listen via iTunes, by searching **Hoare Lea**

Kaizen corner.

改善

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

With social responsibility towards the community, environment and occupants becoming a driving force in building selection, we have a moral imperative to elevate the rate that historic buildings are refurbished and preserved.

Hoare Lea is...



Thinking about.
The UK's first NABERS 5*.
Timber Square, our most exemplar zero-carbon, nature-led scheme, has become the UK's first Design for Performance project to complete an Independent Design Review and score five stars. The ground-breaking award was made following a thorough analysis against NABERS' five-star Design Reviewed Target Rating.
Let's talk - BrianGraham@hoarelealea.com



Talking about.
Committed to lighting the way.
To challenge the industry focus on high-end architecture projects with little consideration of social value, people, and ecology, our Lighting Design team has created five commitments to define their approach. Their new commitments focus on energy-efficient, sustainable and people-centric spaces, as well as sharing knowledge and furthering policy for the industry.
Let's talk - JonathanRush@hoarelealea.com



Caring about.
Our Net Zero Carbon transparency.
Publishing our Net Zero Carbon strategy and carbon emissions assessment for 2020/21 allows us to demonstrate transparency in our Net Zero verification. It also allows other business to see our approach to evaluating, reducing and offsetting carbon emissions arising from building energy use, business vehicle emissions and fugitive emissions.
Let's talk - AshleyBateson@hoarelealea.com

PEOPLE

Fresh perspectives
New voices of the built environment

Sam Wilkinson
Applied Research and Innovation Lead

The future is ours to see – and to sculpt. Research matters for the global challenges ahead.

LET'S TALK
SamWilkinson@hoarelea.com



Research can help us not only to envisage but to conscientiously shape the years to come – by generating insights and knowledge, by creating a foundation for innovation, action, progress. As the glossy brochure tells us, the world of our dreams awaits! What new treasures are out there, waiting to be found or created?

In the field of epistemology (the philosophy of the nature, origin and limits of human knowledge), we can talk about personal or shared knowledge – what an individual may know is a small piece of the totality of what is known. We often discover something new for ourselves, and possibly wonder if we're the first.

Research as collective knowledge discovery

Since knowledge can be created and lost, shared and hoarded, it can be a challenge, in itself, to understand the importance or value of what we ourselves know. Academia concerns itself with moving from the boundaries of our own personal knowledge through to finding the limits of what is known collectively. As we move towards the alluring cutting edge in a particular field, the personal knowledge of a researcher becomes one and the same as the new collective ken – they have unlocked a new realm and contributed to the sum total of human knowledge.

The noble quest

In so doing, we are chipping away at or stepping into an unseen, seemingly endless new world that we were previously entirely ignorant of, as if mining deep underground or exploring the rainforest.

This common visual conceptualisation of research and definitive knowledge centred around the individual, is – on one hand – rather romantic (read: the noble quest) and – on the other – somehow mechanical (a reductionist inquiry uncovering new facts). It broadly centres the importance of objective knowledge over the subjective experience, playing down the significance of the people involved over the method and outcomes. The value comes from the new treasures yet to be found.



We are stepping into an unseen, endless new world that we were previously entirely ignorant of, as if mining deep underground or exploring the rainforest.

In practice, the process is a highly social one, and often more intersubjective than objective: both socially – at a research network level – and societally, with research as a product of and influence on the underlying cultural environment. Careers are made or lost around shifting tribal paradigms of agreed truths and models.

This social context gives life to our individual and collective values, determining where we prioritise our energy and how we go about doing that. The process, or 'journey', of collective knowledge discovery is, in itself, valuable socially, and to those involved there's a positive growth mindset embedded in the pursuit which spreads beyond research circles and can drive change across society.

About a year ago, in the initial stages of developing our Applied Research and Innovation (ARI) team, I asked people where we should be focusing our research energies. Their responses often spoke to broader hopes and fears for the future and revealed the extent to which research discussions are influenced by broader human tendencies towards optimism and pessimism.

The colour and the shape

It seems natural to worry about the future while being optimistic, to want to steer away from the fears and towards the hopes. The decade ahead will be full of challenges in which research has a crucial role in imagining new ideas and finding new solutions. It feels important to consider which values and social dynamics would be important in this process, both in how we prioritise and approach them, and in what we project onto the problems and solutions.

I think research is, at its core, a result of our behavioural curiosity, our social relationships, our hopes, fears, and cultural values. These characteristics give colour to the process itself, making the journey exciting and transformative, and sculpting what we're looking for – as well as what we find. ▣

FURTHER READING/LISTENING:

- Alexander Bird. *The Structure Of Scientific Revolutions And Its Significance: An Essay Review Of The Fiftieth Anniversary Edition*. The British Journal for the Philosophy of Science (2020).
- Iain McGilchrist. *The Master And His Emissary*. Yale University Press, 2019.
- Microsoft Research. *Leading Labs With Dr. Jennifer Chayes*. Podcast 2018: microsoft.com/en-us/research/podcast/leading-labs-with-dr-jennifer-chayes/
- Stuart Firestein. *The Pursuit Of Ignorance*. TedX lecture 2013: ted.com/talks/stuart_firestein_the_pursuit_of_ignorance
- Mark Carney. *How We Get What We Value*. BBC Reith lecture 2020: bbc.co.uk/programmes/m000py8v/episodes/guide

PEOPLE

Jump at the chance.

Jazmin Sawyers.

Sport, law, music, broadcasting: Jazmin Sawyers has made sure to diversify in terms of the spaces she occupies. She tells us why this is key, and shares thoughts on Commonwealth medals and Midlands delicacies, women's athletics and Will.I.Am, and what makes a sporting venue special





Q How is preparation coming along ahead of this year's outdoor competitions?

JS I was gutted not to compete at the World Indoor Athletics Championships but it's given me an opportunity to work on my physical weaknesses and I'm pleased to report I'm back training at 100% – ready to get my outdoor seasons started. It was wonderful to see a championship with a crowd again, it made me even more excited for the outdoor season where we have three majors to look forward to, including a home Commonwealth Games, of course!

Q How did you feel about high-tech equipment replacing plasticine markers to flag take-off fouls?

JS It's always great to see advances in sport but it's important that it's fully explained to the audience and spectators see the tech working in the same way that the officials do – many of the decisions made in Belgrade appeared to be made unfairly on the television but on speaking to one of the officials, they explained to me that the image the public was given wasn't the image they had to make decisions based on. The equipment can work if there's full transparency and understanding, although – speaking candidly – I don't see what was wrong with the old plasticine system! It's much easier to scale down for grassroots competitions, as I can't imagine that many small clubs have access to the high-tech laser equipment.

Q Commonwealth Games; where's your head at? How do you feel about the Midlands hosting?

JS I'm so excited! Competing in Glasgow in 2014 *felt* like I was at home, so I can't imagine how much better it's going to feel, actually being a stone's throw away from where I grew up. Birmingham also holds a special place in my heart as I have jumped personal bests at the old Alexander Stadium, and always find the crowd there to be one of the best in the entire world – I can't wait to get in the new stadium. But if I don't get a chance to try out the track before the games, that won't phase me; I love entering stadiums for the first time on the day of competition; it adds an element of excitement and elevates the experience. It gets me into a mindset where I can produce a special performance.

Q What makes a sporting venue special? Can a home crowd be an extra weight as well as a morale boost?

JS Personally, the physical proximity to the crowd can make a huge difference in how much I enjoy a stadium – when the long jump pit is positioned outside of the track and stands aren't set back too far, I feel like I'm experiencing the whole event *with* the crowd. I can see how some may see the home crowd as an extra weight, as it does come with added pressure but, for me, it's nothing but a boost. I feel like I have thousands of people on my side; it really feels like everyone in the stands wants you to do well when you're at home. High-pressure situations are my favourite. Often my best performances come at crucial competition moments; when I'm at risk of being eliminated or in the final round at my last possible opportunity. The extra pressure of a home crowd really just spurs me on.

Q What do you look for when you arrive at a competition location? What's your optimum performance space?

JS A sizeable warm-up location is the most important factor for me. When I'm fighting for space with hurdlers and sprinters, I'm usually going to lose, and a good warm-up can be the difference between a sub-par performance and a personal best. When it comes to the field of play, it's good to have a space next to the competition runway to do sprints and stay warm, as well as a sheltered area for the athlete to leave their things nearby.



I have jumped personal bests at the old Alexander Stadium many times in my career, and always find the crowd there to be one of the best in the entire world – I can't wait to get in the new stadium.

Q What makes a fast track?

JS The surface used is the primary factor but also how the stadium is built – to allow wind in, or not. While they can result in fast times, very open tracks can be extremely windy to the point where records can't be ratified, or headwinds impair performance drastically. For me, a hard surface is preferable for a long jump runway, which most sprinters would agree with when looking for fast times.

Q Which facilities are your favourite and how does the built environment influence training?

JS The old Alexander Stadium was actually one of my favourite venues in the world to compete in. I liked the surface, it was easily fast enough, and the proximity to the crowd made it such a fun place to compete as I felt like I could involve the spectators all the way through the event and we would compete together. For training, I prefer a softer surface to protect my body as hard surfaces can result in more injuries. The best places to train are those where everything is nearby – at Loughborough University the track, gym, long jump pit and plyometrics mat are in the same area so I'm able to do all parts of my session without interruption.



Sport is real, and the emotions you see, the drama that plays out and the rivalry between competitors is exactly as it appears on TV.



Photo courtesy of Jazmin Sawyers

Equally, having somewhere to take breaks in between tough sessions can make a venue much more enjoyable to train in. Something as simple as artwork or photographs of successful athletes in a training venue can make a difference to how a session goes – there are *many* days when finding motivation can be hard. When you're months out from any major championships and you're already sore and tired, you can forget why you're doing what you're doing. Having reminders can be the push you need to keep going.

Q When it comes to ‘cheat meals’, does Midlands delicacy the battered chip ever feature?

JS I've never tried it! If someone has a recommendation for where to get the best version after the Commonwealths, please get in touch...

Q As the region's new sporting centre, and likely home of Aston Villa Ladies, the Alexander Stadium will be a hub for nurturing the talent pipeline in women's sport. How do you feel this is being managed in athletics?

JS British athletics is doing a great job with the Futures Programme – I was part of this pipeline and it helped prepare me for a senior career, though I'd love to see more support for athletes outside of training and competing. At the moment we have to learn on the go about how shoe contracts and agents work. I'd love to see more education on that so that we're not thrown into the deep end but know what to expect and how to manage our sporting careers as businesses.

Q World Athletics has said it is on track to have a 50:50 gender split on the World Athletics Council by 2027, promising leadership roles to women as part of its #WeGrowAthletics campaign. Where should we see meaningful change demonstrated next?

JS I would love to see them become more open to contribution from the Athletics Association so that athletes have a say in the way our sport is run. I'd also love to see their support with groups such as Tirop's Angels and The Women's Athletics Alliance (I sit on the board for the latter) to ensure that tragedies, such as Agnes Tirop's murder, aren't repeated. Also that young female athletes in East Africa are able to access education on how they can control their careers independently, and the warning signs that suggest they may be being exploited or abused by coaches or others in positions of power.



My success in sport isn't the only thing my happiness and identity are riding on. It's dangerous to have your identity wrapped up in only one thing.



All photos courtesy of Jazmin Sawyers



Q How have you been encouraging young women in terms of sporting outreach?

JS My trip with [development charity] Right To Play was a wonderful insight into the fantastic work they're doing in Tanzania, and across the world, to make sure girls have access to sport and education. Their model focuses on training teachers and community members locally to educate their students through games. Children learn so well through play. Lots of the children I met didn't realise how much they were learning, but they were being taught fundamental skills with regard to health, safeguarding and more traditional subjects of maths and English. The programmes have helped to keep so many girls in school in areas where they may have been withdrawn by their families before they even turned 13. On a personal level, I try to encourage and uplift the young women I come across in my own life. I get messages from young female athletes and try to respond to every one. I know I'd have appreciated the perspective of a professional athlete when I was younger, and sometimes a word of encouragement is all you really need.

Q Sport, law, music, broadcasting: you've made sure to diversify in terms of the spaces you occupy. Why is this important to you?

JS For some people, focusing all their energy on their main goal is the best way to achieve success, but that's never worked for me. I perform best when I'm happy and I'm happiest when I have lots going on. It helps to have things that force me to stop thinking about athletics, as sport can be all consuming, especially when it means so much. Having other interests and hobbies means I can't sit at home brooding over one bad result or training session because I have more to be getting on with. It also means my success in sport isn't the only thing my happiness and identity are riding on. It's dangerous to have your identity wrapped up in only one thing – if you lose it, because of something in or out of your control, you lose a sense of who you are. Make sure you're doing something every week for you as a person, not just you as an athlete/artist/whatever you do the most of.

Q What have you learned about overcoming the labels society places on us?

JS I've come to accept that people are always going to label you and you generally can't stop them. My mantra for this is 'what other people think of me is none of my business'. The labels others place upon me aren't necessarily true, and I have

an idea of who I want to be and try to act in a way that lives up to that person.

Q What did it mean to become British champion during the difficult times of the pandemic?

JS A lot, especially in 2020 – I'd spent the majority of the time leading up to the championships training completely alone. My discipline had never been tested as much as it was during the early stages of the pandemic – the Olympics had been cancelled, there were no major competitions to be preparing for and there was nobody around to check if I'd been doing the work. I knew the work I was doing wasn't going to be of much use until late 2021, and trying to motivate myself to work for something over a year in the future was harder than I'd anticipated, but I didn't miss a single session. I learned a lot about myself and realised that I can be more disciplined than I imagined. I always thought I was the kind of athlete that absolutely needed accountability, and for somebody to be alongside me, encouraging me, in order to be truly successful, but I found out, when that option wasn't there, that I can do a lot myself.

Q What did you learn from being on 'The Voice', and being active in two different competitive arenas simultaneously?

JS How manufactured almost every scenario is. The difference is huge – sport is real, and the emotions you see, the drama that plays out and the rivalry between competitors is exactly as it appears on TV. *The Voice* was... less like that. Producers would decide who they wanted to be rivals; they'd ask you to display some emotions more than others and have the contestants film takes over and over if they didn't look dramatic enough. Sport is a more pure form of entertainment, and true competition. I enjoyed *The Voice* – it was an insight into an industry I knew nothing about – but it didn't feel like a competition in the way that sport does.

Q What was the best thing about working with Will.I.Am?

JS It was an honour to work with such an accomplished, talented individual. Given all the things he's achieved, getting to work through a song with Will.I.Am was special. When I was eliminated, Will stood up to give me a hug and said to me quietly; "you're not mad at me, are you?" as though I could have the authority to question his choice! It was a great experience; one I'll never forget.

Q We imagine your future goals are typically wide-ranging; what's next?

JS Medals. I have a European and Commonwealth silver. I'd like to upgrade those to gold and add some silverware from global championships. I want to further the work that the Women's Athletic Alliance hopes to do – provide access to education for young female runners in East Africa and ensure they're not only safe but thriving in the sport. Coming from Stoke, I'd also love to guest-host an episode of *The Great Pottery Throw Down*, and record an EP and perform it at one of the Stoke venues I loved to attend as a teenager. □



Heriot-Watt University, Dubai.	
The client	Heriot-Watt University
The architect	BDP
The expertise	MEP, Acoustics. From local UAE partners (under HL management): Fire Strategy, Audio Visual, Security, ICT, BIM
The challenge	To facilitate the move away from cellular teaching and equip thousands of students with research-informed, industry-focused British education
The sector	Higher education

Photo: Jon Wallis Photography

	NET ZERO ★  MISSION ACCOMPLISHED	SOCIAL IMPACT ?  WORK TO DO	HYDROGEN ↑  REALISE POTENTIAL
BATTERY STORAGE ↑  LEVEL UP	DISTRICT NETWORK ↑  INVEST MORE	STRATEGY & POLICY /  SEEK CLARITY	HYDRO / TIDAL ↑  LEVEL UP
HEAT PUMPS ↑   LEVEL UP	NUCLEAR /  HOLD WHILST JURY OUT	ENERGY PRICES ↓  SEEK HELP	CONFLICT ↓  STEP BACK
NORTH SEA OIL /  OPPORTUNITY MISSED	OFFSHORE WIND ↑  INVEST MORE	PHOTOVOLTAIC ↑  LEVEL UP	GAS ↓  PHASE OUT
GREEN TECH ↑  MOVE ON UP	GEO THERMAL ↑   LEVEL UP	COAL /  KEEP PHASE OUT ON TRACK	



The irony of the converging energy crises of the last few months has been their energy-draining effects on our collective consciousness. The spirit-sapping news of war, soaring bills, and a debatable Government response plan has left most of us feeling powerless... but might this chaos be the catalyst for real change? Those powering the transformation tell us more.



POSSIBILITIES

Switched on.

In search of the energy endgame.

How we generate and consume energy is perhaps the most significant threat to economic and social wellbeing that we face today. Already high energy prices are only predicted to keep rising; the UK's current use of fossil fuels is unsustainable; and the energy-security crisis – both moral and economic – that Europe is in the grip of, continues.

At home, it's clear that over-dependency on imported gas has taken us to where we are. Energy insecurity carries a massive social and economic price. The 2003 blackout across the US and Canada affected around 50 million people and had an estimated economic cost of approximately \$6.4 billion. The UK, as a whole, is not on the front-line of dependence on Russian gas but neither are we wholly immune from it. And we're not alone in the soaring cost-of-living crisis: energy prices are rising around the world as industries struck by Covid-19 lockdowns resume operations, and energy supplies still need to ramp up after plunging two years ago during the first lockdowns.



Home-grown renewables are cheaper, safer and lower impact...The strategy is right to 'rebalance' costs placed on energy bills away from electricity, to provide a level playing field for heat pumps and other emerging tech.

Simon McWhirter, UKGBC (Comms, Policy & Places)

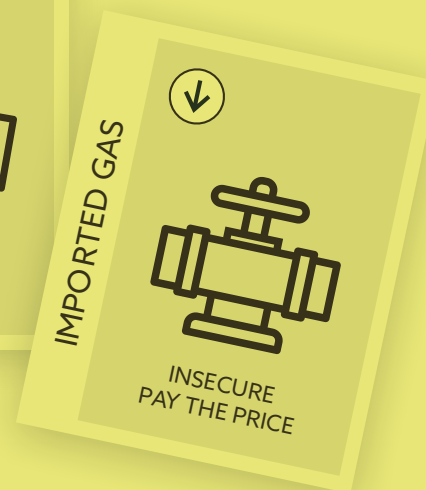
Arguably the imperatives of energy policy must be affordability, security of supply, energy efficiency and carbon reduction. Getting the balance right may involve some compromise on all of them, but the issue lies in pursuing one single-mindedly without acknowledging its impact on the others. Proving warranted are concerns that the war-induced rush to increase oil and gas production (to address the energy price increase) will significantly weaken efforts to reduce greenhouse gas emissions, and they are driving debate about the extent of the response required. "The unbelievably high levels of cash flow that fossil fuel companies are currently seeing is certainly pushing people towards viewpoints that may have seemed a little radical for some in the past," explains Phil Pearson, Associate Director of Energy and Utilities Infrastructure at Hoare Lea. "The lobbying power these companies have is unprecedented and it's what's at the heart of the slow government responses we're seeing."

A windfall tax on fossil fuel companies has serious backing – even the International Energy Agency, not known for its radicalism, has advocated for it in the EU, with the proceeds to be used to ease energy bills for vulnerable people. At the same time, an increasing number of climate scientists, researchers and activists are calling for nationalisation, resource allocation, resource efficiency measures, and price controls on energy.



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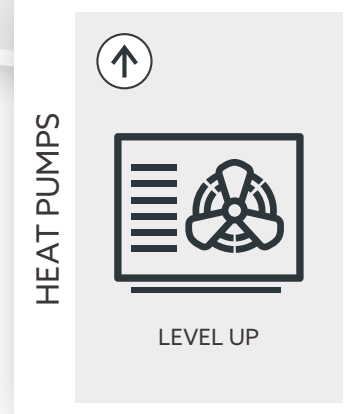


We're really trying to hone in on the fact that any credible strategy must include plans firstly to reduce energy demand and then to expand low or zero carbon supply.

Simon McWhirter, UKGBC (Comms, Policy & Places)

So, taken together, it's no surprise that progressive political leaders are viewing all this chaos as a sign that clean, domestically produced renewable energy is the only way forward. "It's frustrating that it takes something like the current energy landscape to provoke this discussion," notes Phil, "but it's good to see the conversation changing – we now need collective pressure across industries to challenge the recently released UK energy strategy to go further. It was framed as a route to securing the UK's energy supplies and try to dampen soaring costs for consumers and industry, but the lack of a joined-up approach, to both tackling the problems and capitalising on the green opportunity, is frustrating. However, those at the coal face (or should I say 'renewables face'!) must continue our efforts to actually enact proactive change in the meantime."

Indeed, the built environment industry's climate-driven voice, led by the UKGBC, has begun to do so. "We're really trying to hone in on the fact that any credible strategy must include plans firstly to reduce energy demand and then to expand low or zero carbon supply," explains UKGBC's Simon McWhirter (Comms, Policy & Places). "The strategy was a chance to insulate the nation's homes, protect us against future price hikes and tackle the devastating effects of rising energy costs on households across the UK, but it completely misses this opportunity. Ramping up renewable energy is, of course, welcome, but this does nothing to stop heat leaking from every window, wall and roof of the UK's 29 million homes."



Ramping up renewable energy is, of course, welcome, but this does nothing to stop heat leaking from every window, wall and roof of

29m
UK homes





The cost savings that district heating can bring are phenomenal. If we look to other countries like Denmark – where district heating proved to be so popular that it is now a legal requirement that inhabitants of cities have to connect to their district heating system – it’s a no brainer.

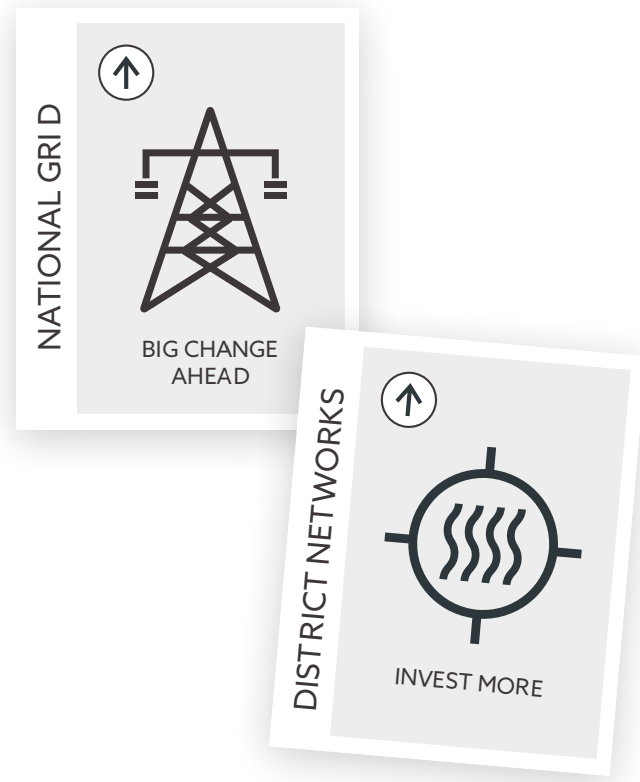
Phil Pearson, Associate Director of Energy and Utilities, Hoare Lea

So, looking to the future, it’s clear that a new energy landscape will have to be carved out. “The ‘Net Zero by 2050’ imperative is, quite rightly, now up there in the public consciousness as energy security and affordability,” says Phil. “We are looking at the biggest change to how customers consume electricity since the National Grid was developed nearly 100 years ago. Energy masterplans in cities like Manchester and Bristol are demonstrating that projected increases in demand far exceed current capacity. Luckily, decentralised energy is a rapidly deployable and efficient way to meet that demand, while improving energy security and sustainability at the same time.”

Decentralised energy, while not yet fully dominant in the mainstream market, is known within the industry as energy generated off the main grid. It encompasses combined heat and power, district heating and cooling, solar, geothermal and biomass energy, or even energy from waste plants. These can serve a single building, whole community, and even rolled out for entire cities.

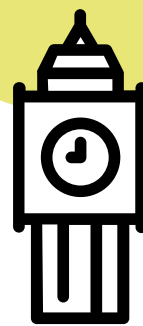
According to the Energy Saving Trust, more than 17,000 district heating schemes are now in place across the UK, with numbers set to increase over the coming years. For example, London wants to reduce its reliance on national energy infrastructure, with the aim of supplying 25 percent of its energy through decentralised sources by 2025. “The cost savings that district heating can bring are phenomenal,” Phil notes. “If we look to other countries like Denmark – where district heating proved to be so popular that it is now a legal requirement that inhabitants of cities have to connect to their district heating system – it’s a no brainer. Approximately 89 percent of the city’s heating needs are supplied by district heating, and they’re now connecting their district heating systems to renewable energy sources such as wind and hydro.” Knowing that in the not-too-distant future, every city in the country is going to be heated by a zero-carbon source means that Denmark is on track to meet its commitment to fossil-free heating and electricity by 2035.

By comparison, the UK’s discovery of vast resources of natural gas in the 1960s led to the approach we now find ourselves dealing with. The vast majority of the country was connected to gas. Now, as a net importer of natural gas, district heating is a promising route out of our issues.



17,000+

district heating schemes in the UK



With London looking to supply

25%

of its energy from decentralised sources by 2025



Each passenger on the London Underground emits 100W of energy



Heat from the trains and electrical equipment



Used to heat

800

nearby apartments

“A very cool example of real innovation taking place is how we’re now using the heat of the London Underground to heat the homes of Londoners,” Phil enthuses. Similarly, the heat network at King’s Cross in London supplies space and water heating to more than 800 nearby apartments. Each passenger passing through the station releases more than 100 watts of energy in body heat. Add to this all the trains and electrical equipment and you end up with very high temperatures – and therefore a massive amount of heat that previously would have had to be reduced to maintain safe environments. Instead, it’s now being redirected to where it’s needed. “These are all simple systems thinking concepts that are at the heart of sustainable strategies, and which the industry is now waking up to the myriad benefits of,” notes Phil.

So why aren’t more decentralised energy projects happening in the UK? The barriers to mass take-up are not technical nor even primarily financial. The major obstacle to mass take-up of decentralised energy is simply limited experience and expertise in the public sector, which is a purely institutional issue. Many organisations struggle to be fully clear on the part that they can play in developing and implementing such projects. But while there is a lack of experience, luckily this is not the case when it comes vision and enthusiasm to grasp the opportunity.

Certainly, it’s easy to see how a shift in public consciousness, fuelled by climate awareness and warranted fury

and frustration regarding the surge in energy prices, could take place. It aligns with a trend that’s already being seen post-pandemic for thinking locally and more communally. And, with support for the energy transformation coming from high-profile people, it feels like an inevitable evolution for society.

As Kevin McCloud so articulately puts it: “In the UK we understand what it is to share a meal, to work an allotment and share produce, to co-own a community asset like a park or join a car club. We are, perhaps, no longer a society hooked on the idea of ownership and we are ready for the joys and the affordability of more shared stuff... By which I mean heat networks.”

So, although decentralised energy is certainly not the only solution, it offers an already-established route and a realistic view of how energy will work in 20 or even 50 years’ time. Ultimately, ethically meeting the three tests – affordability, carbon reduction, energy efficiency, and security of supply – is a balance that can be met; even more excitingly, the spirit in which it can be done sends a message of cooperation and community-led collaboration that extends to some of the biggest challenges that lie ahead. □

LET’S TALK
PhilPearson@hoarelea.com



Many organisations struggle to be fully clear on the part that they can play in developing and implementing such projects. But while there is a lack of experience, luckily this is not the case when it comes vision and enthusiasm to grasp the opportunity.

National Quantum Computing Centre, Oxfordshire.	
The clients	NQCC. Jointly delivered by EPSRC and STFC as part of UK Research and Innovation, with £93 million of funding
The architect	Hawkins Brown
The expertise	MEP, Sustainability, Security, Fire Engineering, Acoustics, Lighting
The challenge	To provide headquarters of national strategic importance, accelerating development of quantum computing, attracting global interest and making the UK a go-to hub for R&D, while building a resilient future economy
The sector	Science & research



Image: Hawkins Brown



Space scientist and 'The Sky At Night' broadcaster Dr Maggie Aderin-Pocock MBE talks telescopes and toilet rolls, cross-fertilisation and the cosmos, and never dropping The Clangers...

PEOPLE

Dr Maggie Aderin-Pocock MBE

Boldly going.

Photos: James Cheadle @ The Royal Institution



Exploration

It takes on many different facets for me. There’s obviously space exploration, but also exploring our planet and our minds. With exploring there’s so much cross-fertilisation...

Discussing the fascinating unknowns of human intelligence at the Royal Palace of Stockholm – where the first World Dyslexia Assembly saw Dr Maggie Aderin-Pocock share the power of her own dyslexic thinking – has reminded the eminent space scientist of what exploration means to her.

“It takes on many different facets for me,” she says. “There’s obviously space exploration, but also exploring our planet and our minds. With exploring there’s so much cross-fertilisation - when we went down to the deep oceans, we found life where we didn’t think life was possible. From that, we are now looking out into deep, dark space and thinking about whether life can occur on the moons of Saturn.”

Captivated by space and scientific discovery since she was a little girl in the Seventies, stationed in front of the television and glued to intergalactic cult classics, Maggie always craved to set foot on cosmic soil. “The Clangers were very formative for me; I just loved these little creatures with their little ears. They caught my heart and my attention, so one of my childhood dreams was to go and meet them.” Tears of pride and joy would stream, decades later, when Maggie finally managed to do so, appearing in their 50th anniversary special *The Visitor*, in miniature model form.

From mousey moon-dwelling critters, Maggie made the leap to loyal Trekkie – “it turns out that *The Clangers* is the gateway drug that leads on to hardcore science fiction” – and before long was taking her first steps into space instrumentation. And while for most of us, as children, the extent of building a telescope would simply call for the cardboard tube of an unravelled toilet roll, Maggie had the real deal in mind.

Clear, early focus

“I’d bought a telescope but it had plastic lenses and wasn’t very good. I saw an evening class in telescope making in a magazine (you could make a telescope?!) so I went along, expecting I’d need to take my loo roll – me, about 13 or 14 at the time, and everybody else there white and male with an average age of about 50.

“What you can do is take two slabs of glass, put an abrasive powder in between them, then grind away. I used to watch *Star Trek* while making my telescope mirror; it took me about six months. One surface becomes convex and one becomes concave, so you take the spherical concave surface and make it into a parabola – the perfect shape for taking light from a long distance away and bringing it into a nice, sharp focus. I made the mirror, got it coated, built a box to go around it and then I had my telescope.”

Most people make a fairly simple Newtonian telescope with their parabolic mirror plus the sort of simple flat mirror you can buy anywhere. Not Maggie. “I wanted to jazz things up so I made a Cassegrain system which involves making the mirror, punching a hole in it, then making a hyperbolic mirror, which I had no idea how to do. It probably didn’t give the best imagery, but it was good fun!”

Passions proved and life-path coordinates positively plotted out, Maggie would go on to study physics and mechanical engineering, subsequently innovating more sophisticated scientific instruments, including hand-held landmine detectors and optical sub-systems for spacecraft. But it was far from a straightforward take-off – school was hard.

A struggle on life’s launchpad

“Science saved me,” she claims, explaining how moving schools 13 times didn’t make things any easier. “With my dyslexia I was put in the remedial class so I was effectively written off. But I remember sitting in a science class one day and my teacher asking the question: if one litre of water weighs one kilogram, what does one cubic centimetre of water weigh? As dyslexics, we’re really logical, so I thought; I’ve got this! I looked around the classroom and nobody else had their hand up so I put my hand down – I never put my hand up... The teacher was surprised. I put my hand up again and answered: one gram, miss? And she said: that’s right, Maggie! At that moment, I thought; if I can do that, what else can I do? It just opened the floodgates.”



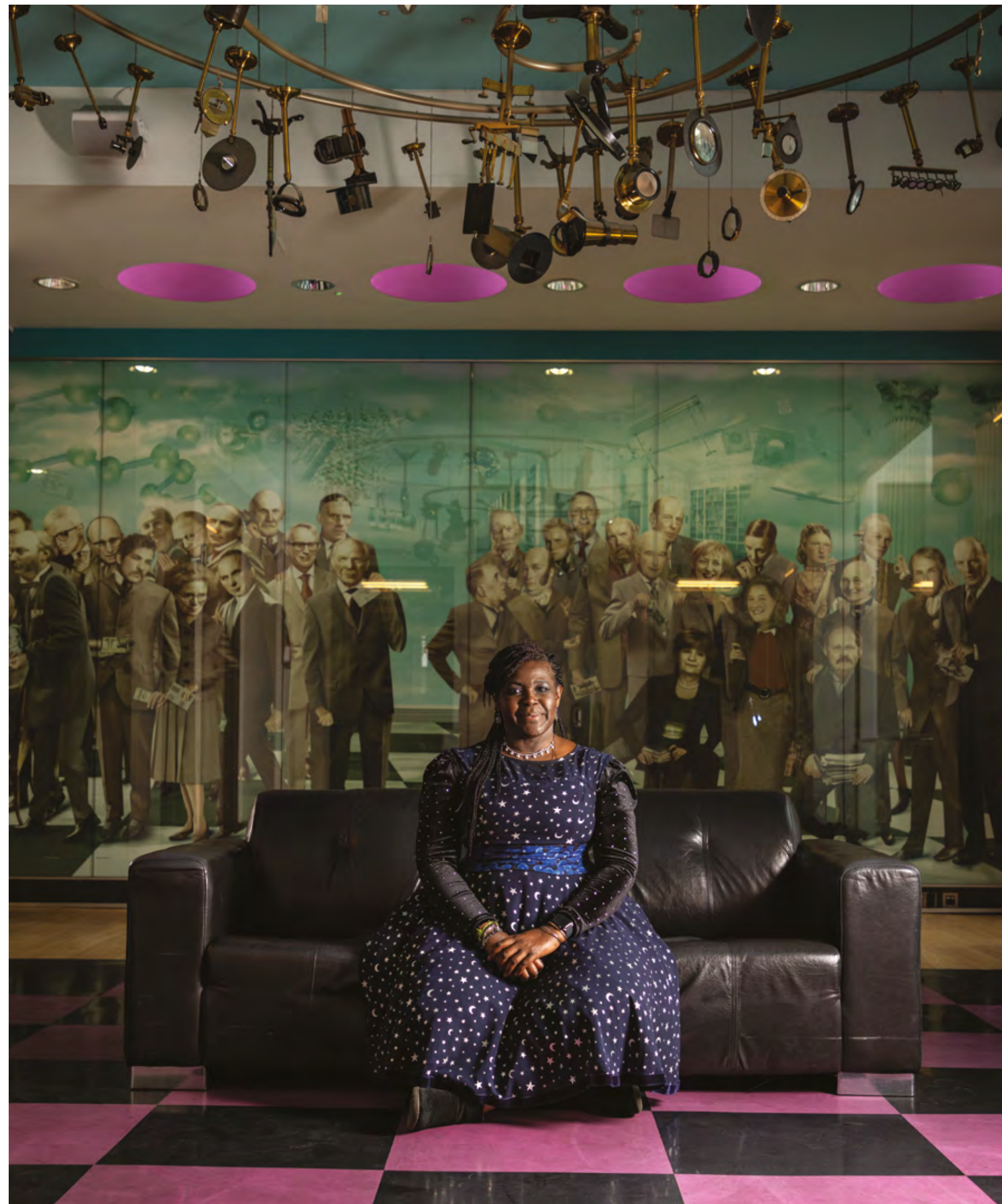
On dyslexia

Science saved me... At that moment, I thought; if I can do that, what else can I do? It just opened the floodgates.

Photo right

The ghosts of STEM past, and a face of its future:

Maggie imparted her wisdom to guests of Hoare Lea at the Royal Institution recently, following in the footsteps of those who’ve shaped the esteemed science hub over its 200-year history – the likes of Michael Faraday (electric motor inventor), Alexander Graham Bell (telephone inventor), Ada Lovelace (mathematician) and Joan Evans (the first woman to give a Friday Evening Discourse)





1

As we get more AI, and the world of work changes, it is that creativity and logic – for example, the way that dyslexics think – that we will need, that will be the job requirements of the future. So, in every team you need diversity.

At another school, a serendipitous split-second choice – answering ‘top’ when asked which learning group she belonged in – saw her work twice as hard to keep up but also led to a lifetime of successful opportunism.

As an adult in the Nineties, she jumped at the chance to join the team working on the ground-based Gemini – the “wonderful eight-metre telescope that sits in the foothills of the Andes” – and spent a good six months out there, making some of the happiest memories of her career.

More latterly she was part of the team working on the James Webb infrared telescope, launched on Christmas day last year. “I was there, biting my nails. But now it’s gone up in space and I’m hopeful that it’ll give us more detail, and new understandings, of what’s out there. It has travelled 1.5 million km to the Lagrangian Point 2, which is like a gravitational null where it can sit without using propulsion, and it goes round the Sun with the Earth – although it’s looking away from the Earth. If it points towards the Sun or the Earth, the sensors will be blinded because it’s infrared, so it’s looking back in time to some of the earliest stars and galaxies in the universe.

“Each telescope does a different thing – UV, infrared, visible light – and it’s not until we merge them all together that we get a complete picture of the universe.”

It’s this appreciation of the holistic and the merits of mixing specialist and generalist thinking that has helped Maggie secure work on projects in private industry, academia and government. It has also seen her become an ambassador for the value of racial, gender and neural diversity and the vital wider insights that different backgrounds and perspectives can bring about.

Diverse thinking: vital for our future

“We need neurodiversity, and diversity of every sort,” she says. “When you have lots of like-minded people doing stuff, you limit how far you can push forward. When you’ve got a diverse team and thinking is pinging off in different directions, you get a much broader solution to the challenges we face.

“As we get more AI, and the world of work changes, it is that creativity and logic – for example, the way that dyslexics think – that we will need, that will be the job requirements of the future. So, in every team you need diversity.



I decided I needed to go out and sell space science. I wanted to show that as a space scientist I get to travel the world, to take on the big challenges like climate change and make a real difference in society.

"It's so important for the exciting reignition of the UK space industry too; I think that's been one of the biggest changes in science and engineering recently. Before, many of us were in our own silos; physics over there, maybe a bit of biochemistry... Research councils and many companies have realised that when you start putting these different disciplines together, that's when you get the real benefits; comparing and contrasting, learning from each other's mistakes. I think that's so important."

An enthusiastic STEM educator, who has not only shared her experiences of dyslexia but also being part of the science world as a Black woman, Maggie is passionate about dismantling social mobility barriers and has imparted wisdom and encouragement to scores of inner-city schoolchildren. Having found dyslexia a hindrance that held her back when she herself was at school, she now counts it as her 'superpower', crucial in her science communication work where it enhances her storytelling and ability to take people on an emotional journey.



Selling space

"I set up Science Innovation [public engagement company] around 14 years ago to help recruit people into the space industry, which is pretty cool, so you'd have thought people would be queuing up to join us, but at the start we weren't getting many applications coming through. I decided I needed to go out and sell space science. I wanted to show that as a space scientist I get to travel the world, to take on the big challenges like climate change and make a real difference in society."

Embarking on her educational mission, Maggie made a start on school visits – 20 kids here, 30 kids there – and soon it ramped up. Since 2008, she's inspired 350,000 of them.

She hopes one upshot will be to get more girls into STEM. "This last International Women's Day, the hashtag was #BreakTheBias, and if you look at the data, it's all pretty grim. Only 22% of the core STEM workforce are women. Back in 2019 there was a moment of celebration – for the first time, more girls had taken biology, physics and chemistry than boys. Yes! But when you looked closely at the numbers, they were still very biased in ways.

"When I first started going out to schools, I thought I needed to go to girls' schools but it turns out that girls in girls' schools are more likely to take physics and engineering. It's a broader problem; it's about spreading the word throughout society."

Going beyond the hard hat

Maggie also likes to talk role models and relevance – using examples of the wide range of jobs she's done with a degree in physics and a PhD in mechanical engineering. "The more of us who talk about it – get out there, to schools, festivals, and tell people what we do – the better! People have very odd images of what the built environment is about; the hard hat and such. They don't see all the other stuff that goes on behind it; the complexity and the glorious things that are made. It's about changing perceptions."



People have very odd images of what the built environment is about; the hard hat and such. They don't see all the other stuff that goes on behind it; the complexity and the glorious things that are made. It's about changing perceptions.



Maggie in her role as presenter of *The Sky at Night*, outside the Royal Greenwich Observatory. Photo courtesy of BBC/Victoria Weaver.

The roles she's had certainly are myriad – in science, in space, as motivator, media maker – and exploring is clearly something she's embraced throughout her career, with a proclivity for diversifying, staying agile and looking to the future. As well as presenting the BBC's *The Sky At Night* and taking part in plenty more projects besides, over the years, Maggie's now on the council of the Science and Technology Facilities Board. "I've been to many cleanrooms across the world but my goodness, theirs are amazing. They're vast! They'll do amazing stuff; the space industry is just booming across the world and in the UK it's really taking off. It's a very exciting time for the space industry here and having facilities like those is really going to help.

"In the next six to 10 months, we'll have our own launch capability, the only one in Europe, able to launch small satellites on UK soil. In the past we talked about satellites being the size of double decker buses but now there's a whole industry of small, quick-turnover satellites which go up, measure a few things and come back to Earth. With that launch capability, many people across the country and Europe will be able to be part of satellite launches – I'm certainly trying to sign up for that!" □

Photo: Simon Upton / EPR Architects



NoMad Hotel, London.	
The clients	NoMad Hotel
The architect	EPR Architects
The expertise	MEP, Sustainability, Lighting Design, Acoustics, Fire Engineering, Vertical Transport
The challenge	To transform a Grade II listed 1800s magistrates' court and police station into a five-star luxury hotel with fine dining restaurant, events spaces, club and bars, protecting the building's heritage while creating amazing guest experiences
The sector	Hotels; Arts, Culture & Heritage



Director Catherine Macpherson shares some of the transformative projects that have helped to make Bristol the globally-renowned city it is today.

LET'S TALK

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Shaping my city.

Bristol.

HOARE LEA & BRISTOL

Our Bristol office opened more than 60 years ago and has since become one of our largest office sites, housing everyone from engineers, consultants and specialists, to our digital engineering team and supporting management groups. It's home to a spirited community of people who are passionate about projects that shape Bristol and beyond for the better.

Near the waterfront...

1

Portwall Place. COMPLETED

This is a great example of a high quality, large-scale workspace in Bristol. Working with progressive developers on this scheme propelled us into more exciting and bigger-scale projects. Portwall Place was a great catalyst for this as it needed to balance the environmental conditions required for people to thrive in the space, alongside the challenges of an impressive, inspiring building, where the large glazed atrium floods the space with natural light.

2

Clifton Suspension Bridge. IN PROGRESS

You cannot beat the suspension bridge when it comes to emblematic Bristol landmarks. We're so proud to have recently won the competition to work with the Bristol Suspension Bridge Trust to transform the way it's lit, by looking at solutions from integrated architectural,

maintenance, energy and flexibility perspectives. Our pitch was all about exciting ways that the bridge could be used as a statement of the city's progressive mindset and support key moments throughout its calendar. It won't be a quick job, but it's one we couldn't be happier to be involved in.

3

Wapping Wharf.

PHASE 1 AND 2 COMPLETED

We love popping down to Wapping Wharf in my house! It's such a brilliant example of how thinking about community, tourist and independent business needs can result in something that works perfectly for all. We often stop by one of the food retailers based in Cargo to grab an always-tasty bite to eat before a wander around the harbour. Working with the architects and employing our extensive residential experience, we were able to create an on-site energy centre that utilised energy from the city's district heating network to ensure the development is as energy efficient as it is enticing.

4

The Welcome Building.

IN PROGRESS

As you approach Bristol on the train, this epic building, adjacent to the railway, will welcome you. Its location is in the Temple Quarter Enterprise Zone, which has been a major driver in attracting world-renowned business to the city. Sustainability sits at the heart of

the project and we're targeting BREEAM Outstanding, Wired Score Platinum, EPC A, and WELL Platinum ratings – truly a project focused on people and planet. Setting a new standard for environmental sustainability, it's also designed to become a space for events, interactive art, wellness – and to cultivate a collaborative occupier community. This is a project that I'm really proud to be delivering and I can't wait to see it finished.

5

Assembly.

A COMPLETED, B AND C IN PROGRESS

Assembly was one of my first Bristol projects and you couldn't hope for one more inspiring than Assembly A with its striking external structure. This is a collection of three new high-quality workplace buildings, that stylishly sit in the centre of Bristol opposite the Floating Harbour and near Temple Meads Station. Building A was the largest office in Bristol when it was constructed and saw the biggest pre-let in the city to date, going some way to deal with the pent-up demand. The engineering systems were designed to allow ultimate flexibility, reflecting the changing needs of the letting market.



Shaping my city. Bristol.

Illustration: Naomi Skinner



The vibrant heart of the city...

6
St Mary Le Port
IN PROGRESS

This is an area of Bristol that has been neglected for some time, despite its central location. In fact, this part of the city was hardest hit during the bombings of World War II. We're delighted to be able to be involved in the exciting plans for the site; the three planned large workspaces will all go beyond the carbon emissions requirements and will honour the history of the area by rebuilding several of the old streets, so we can't wait to get started.

7
Horizon House
COMPLETE

This was the new headquarters for the Environment Agency, and we achieved the highest ever BREEAM rating (85%) of its type when completed in 2010. The space was designed to be filled with natural light and ventilation, which successfully reduced related energy consumption. Most interestingly, we undertook an evaluation study (five years after completion) to review measured energy use data and feedback on performance, finding it was still achieving the exceptional levels expected.

8
The Galleries
INCOMING

The Galleries is the original shopping and social destination in Bristol, but unsurprisingly after Cabot Circus opened in 2008, it lost its shine and has seen a steady decline in visitors in recent years. We do like a regeneration challenge though, so we're involved in new proposals to replace the existing shopping centre and multi-storey carpark with a pioneering sustainable mixed-used destination. There will be flexible workspaces, inclusive student accommodation, affordable housing and build-to-rent apartments, an aparthotel and mixed retail – built around a new pedestrianised landscaped street. We're currently at pre-planning stage but I'm already excited about the ambitious approach to energy and carbon.

9
Cabot Circus
COMPLETE

Such a transformative project for Bristol... It's the landmark that greets most people at the end of the (rather miserable!) main M32 route into the city, so a showstopper was vital. In 2008, it completely set a new benchmark for high performing, sustainable retail centres – at the same time showing what could be achieved when experts from across disciplines work together. Roads were moved, the first fully covered, open streetscape was modelled, and we managed one of the largest telecoms trench-share agreements ever seen. Together, it meant we were not just re-establishing Bristol as a sought-after retail and leisure destination, but also helping to create a new landmark in urban regeneration.

10
Soapworks
IN PROGRESS

This is a site for which many Bristolians hold much affection, so ensuring its development creates a vibrant and inclusive new district, for people to work in, live in and enjoy, is close to our hearts. This brilliant mixed-use scheme is targeting impressive environmental credentials and has focused on social value, with the development committed to creating new jobs, unique homes, and green public spaces for all to appreciate. At the centre of the site, the Grade II listed soap-pan building is core to the heritage of the area and we're focused on showcasing its history to provide a quirky workspace that can inspire the innovative and creative Bristol workforce! Having worked on this truly iconic scheme for the last three years, I am really excited to see it moving forward and into construction.

Peak practice: united in one mission.

Humanitarian engineering work overseas hammers home the passive design approach – doing as much as possible with as little impact as possible.



Driven by Article 25 of the UN's Universal Declaration of Human Rights – stating everyone's right to adequate, dignified shelter – architectural charity Article 25's vision is a world where all communities have access to better housing, safe school buildings and effective medical clinics. With the skills and knowledge to make this a reality, Hoare Lea has been working with Article 25 for years, providing engineering and financial support for schools and childcare centres in Tanzania and hospitals in Myanmar and Nepal.

Kate Glensman shares her experience at The United Mission Hospital in Tansen, in the Palpa region, west of Kathmandu...

Senior Associate, Hoare Lea Kate Glensman:

"The hospital employed Article 25 to assess its options in expanding and upgrading its incredible site – which has a great reputation in the community, but some of its buildings are over 50 years old and no longer fit for purpose. They wanted to make sure the site could withstand future earthquake risks and increased patient numbers while improving the level of care.

Article 25 in action: a factfinding mission

"The hospital is constrained and, as with pretty much everything in Nepal, sits over a very sloping site. It has 'evolved', with extensions built when funding was available. There's little space left now; to achieve their goals, a phased approach is needed, which sees some buildings demolished before new facilities can be built in their place. The hospital realised that employing an architect would pay dividends, and turned to Article 25. On our factfinding mission, we helped carry out a survey of the United Mission site. We identified the kinds of systems that the hospital uses now, any problems reported by staff, and opportunities for improvements.

"Article 25 had been into the London office to talk about their work, but in 2016 a call went out from Ashley Bateson for engineers to get more directly involved for a three-month period, delving into projects and answering

their questions. It sounded like a great opportunity to do something completely different. Then, this year, I took over the coordination of our Article 25 support.

"It's important for engineers to get involved – it's a great way to make a difference in parts of the world that we'd never normally have access and exposure to, supporting people that can really benefit from our input. It's a personal challenge that can improve you as an engineer. You have to think about different environmental concerns, understand the kinds of technology and equipment that are available and affordable, ensure that you design something that local people can build and maintain. You can't rely on a lot of the infrastructure we are used to here. It really hammers home the passive design approach – doing as much as possible with as little impact as possible becomes all the more important.

"I'm continuing to support hospital staff as they monitor their power usage to give them an idea of how close they are to capacity, and inform design. If the hospital is happy with Article 25's proposals, the project will move into early stage design." ■

LET'S TALK

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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.

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Sectors

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



Exploare.

BOLDLY GOING WITH DR
MAGGIE ADERIN-POCOCK

RESEARCH MATTERS
WITH SAM WILKINSON

LEAPS AND BOUNDS
WITH JAZMIN SAWYERS

THE FUTURE OF ENERGY
WITH THE EXPERTS
FUELLING CHANGE

BUILDING A RESILIENT
ECONOMY WITH
QUANTUM COMPUTING

HAMMERING HOME
PASSIVE DESIGN WITH
HUMANITARIAN WORK

State-of-the-art immersive dome,
Market Hall, Plymouth
Photo courtesy of LHC Architects /
Real Ideas Organisation