



Construction  
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**Construct**ZERO  
The Construction Industry's Zero carbon change programme

# Business Champions

Mott MacDonald Application

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## Dear Stuart Young

Please find enclosed our application to be a COnstructZero Business Champion.

Delivering net zero is an urgent priority for our business and decarbonising infrastructure is an agenda we have been leading on for many years. The construction sector must take a leading role in delivering the infrastructure required to transform our economy to net zero and in ensuring that future infrastructure is planned, designed and delivered in a low or zero carbon way.

We applaud the leadership shown by BEIS and CLC in launching the Business Champion programme. Industry collaboration will be essential to deliver net zero and we are proud to participate in this initiative.

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Mark Crouch

Carbon Management Discipline Lead



# 1 Mott MacDonald company profile

We're an employee-owned global engineering, management, and development consultancy. Our purpose is to improve society by considering social outcomes in everything we do, relentlessly focusing on excellence and digital innovation, transforming our clients' businesses, our communities and employee opportunities.

Mott MacDonald has a proven track record providing technical and strategic advice to companies globally. As a global organisation, we are proud to be the first major company in our sector to be carbon neutral and certified to ISO14064 and PAS2060. Our internationally recognised thought leadership in Carbon Management and Energy Transition includes the Infrastructure Carbon Review for Her Majesty's Treasury (2013) and we co-authored the PAS2080 (Carbon Management in Infrastructure) standard. We are also the conveners of the UK Net Zero Infrastructure Industry Coalition which was formed to harness our collective expertise to support the delivery, and maximise the benefits, of UK net zero.

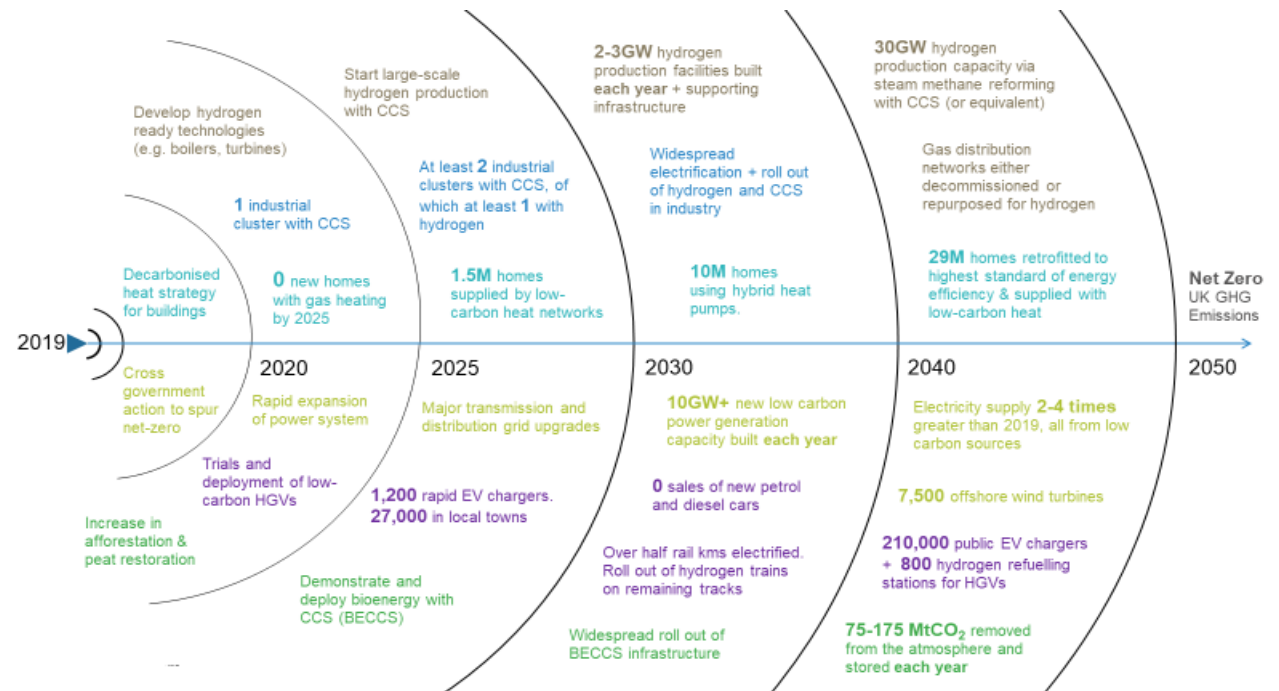


Figure 1: The scale of infrastructure required to reach net zero

Source: Building a net zero economy, Net Zero Infrastructure Industry Coalition, 2019

## 2 Business leader interview: Professor Denise Bower OBE



Denise is Mott MacDonald's Executive Director, External Engagement. She provides board level governance for our response to the climate emergency from all levels of our business.

Professor Denise Bower OBE joined the Mott MacDonald Executive Board as the director with responsibility for external engagement in January 2020. With a global remit she has responsibility for client and partner relationships and thought leadership activity, along with supporting the business functions of marketing and internal engagement and communications. Denise is responsible for driving improvements in the delivery of major projects and for Mott

MacDonald's corporate commitments on global issues. She is the executive sponsor for sustainability and climate change and works with external organisations that are bringing about transformative action, such as the Coalition for Climate Resilient Investment (CCRI), which is a flagship initiative for COP 26 in the UK.

Denise has had an impressive career in the infrastructure industry. She is very well known through her role as the executive director of the Major Projects Association and as Professor in the School of Civil Engineering at the University of Leeds. Denise was a long-standing member of the Infrastructure Client Group and has worked closely with the Infrastructure and Projects Authority to improve major project preparation and delivery.

### 2.1 Why is making progress on Net Zero important to your business?

Climate change is among the biggest threats facing humanity. The science is clear on the imperative to contain greenhouse gas emissions and keep global warming below 1.5°C. Governments and businesses around the world are working towards greenhouse gas neutrality. We have decided to take a position of leadership – to use our knowledge, ingenuity and influence to help the world successfully transition to a low-carbon future.

This is our responsibility and an exciting opportunity to lead and to partner with leaders who are committed to sustainable development. This is also an opportunity for innovation, efficiency and competitive advantage.

We have developed a [net zero greenhouse gas emissions position paper](#) to set out our position and commitments, which we revise annually.

### 2.2 Which of the 9 priorities are more relevant to your business and clients and why?

As a global and cross-sectoral business, all of the nine priorities are relevant to our business and clients. We are involved across all sectors and throughout the infrastructure project lifecycle. On our infrastructure projects, we can make the greatest difference at the earliest stages in the design process. This was a point we emphasised when authoring the [Infrastructure Carbon Review](#) in 2013 on behalf of the UK Government, and later when we co-authored [PAS2080](#), the Carbon Management in Infrastructure standard.

Our business can have a potentially even greater impact before the design process even begins, through early client engagement, developing net zero strategies at an organisation and sector level, and being a catalyst for industry change and influencing policy. Together with a group of forward-thinking UK businesses and public sector organisations, we formed the [NetB Zero Infrastructure Industry Coalition](#) to collaborate and bring our joint expertise to explore pressing issues that the infrastructure industry needs to address.

Table 1 maps some examples of the nine priorities against our activities. I would highlight the following as being of greatest relevance:

- (8) *Become world leaders in designing out carbon.* We are certified to PAS2080 across our global business, the first consultancy to be certified in this way. We have been working with clients to enhance their PAS2080 maturity, exporting application of the standard to countries including the United Arab Emirates, New Zealand and the United States.
- (7) *Implementing carbon measurement, to support our construction projects in making quantifiable decisions to remove carbon.* This is an area that we have led the industry on, developing our [Moata Carbon Portal](#) tool; to enable rapid carbon quantification and optioneering with powerful BIM-integration. The tool is cloud based and we are increasingly providing client access to the tool with bespoke datasets to suit their asset types.
- (5) *Scale up industry capability to deliver low carbon heat solutions.* Decarbonising heat is an urgent challenge, yet one that presents tremendous opportunities and could lead to the development of completely new industries offering large scale employment and economic growth across the UK. The Net Zero Infrastructure Industry Coalition chose to focus on the [Path To Zero Carbon Heat](#) for our first deliverable.
- (3) *Championing developments and infrastructure investments that both enable connectivity with low carbon modes of transport and design to incorporate readiness for zero emission vehicles.* Along with heat, transport is another sector that requires rapid decarbonisation and which our company has a lot to offer, through our planning, investment and design expertise. [A place-based approach to net zero](#) explores city scale transitions to net zero.

### 2.3 What are you doing to make progress against the relevant priorities (of the 9) in the short and long-term? (Could include targets or milestones)

We advise our clients on the implications of net zero and design projects that will deliver net zero greenhouse gas emissions, but we also decided we needed to begin with our organisation. In 2020, we became the first company in our class to be [certified carbon neutral](#), to ISO14064 and PAS2060. Also, in 2020 the Science Based Targets initiative (SBTi) certified that our greenhouse gas emission targets are aligned with a with a 1.5°C pathway.

This year we joined the [Race to Zero](#) campaign by signing the Business Ambition for 1.5°C commitment. In the last decade, we have been instrumental in setting the agenda to reduce greenhouse gas emissions in infrastructure asset delivery and management, recognising that this also makes good business sense by cutting cost and unleashing innovation.

We have reduced our global carbon footprint by 45% per employee over the last five years and are on track to reduce our absolute emissions by a further 25% by 2024. We are demonstrating our future intent by identifying industries that are not aligned with a net zero world, such as coal-fired power generation, and withdrawing from those markets and by helping our clients to transition to a more sustainable and climate resilient approach. Aligned to this we have recently joined the [Powering Past Coal Alliance](#).

In our view, being a net zero organisation is about doing much more than being carbon neutral and addressing our own organisational emissions. Our goal of being a net zero organisation also needs to capture our client interactions, our industry leadership and advocacy, to support the urgent societal shift needed.

We are currently committed to being a net zero organisation by the end of 2040 and are being even more ambitious by exploring options for bringing forward that date. As the SBTi is revising its definition of net zero, we will reconsider our position statement when this is published.

## 2.4 How have you helped your supply chain understand what is required against the 9 priorities?

Our business has the most direct influence on our clients, and their supply chains. We have committed to supporting our clients with this five-point plan:

- Whenever possible, we will show our clients how they can transition to net zero and support them by identifying risks and opportunities associated with the transition to net zero.
- We will help our clients develop realistic organisational, institutional and regulatory frameworks for net zero.
- We will help our clients mobilise and transform their supply chains through applying influence, leadership and information-sharing.
- We will show our clients how to maximise the benefits of zero-carbon solutions for their business, their clients and society.
- We will use our ingenuity to show how the costs of a net zero transition can be minimised and our influence in the infrastructure industry to show how finance can be mobilised.

We have influenced and will continue to influence our clients and their supply chains through our strong relationships. In addition to projects, we do this via a range of industry forums, for example being leading contributors to the [ICE Carbon Project](#).

We also convened the Net Zero Infrastructure Industry Coalition in response to the UK government's 2050 net zero greenhouse gas emissions commitment. Coalition members include Mott MacDonald, Skanska, the UK Collaboratorium for Research on Infrastructure & Cities, UK Green Building Council, Anglian Water, Transport for London, Engie, Pinsent Masons, KPMG, Energy Systems Catapult, Carbon Trust and Leeds City Council.

We believe in disseminating carbon management knowledge throughout the industry, which is exemplified by our annual infrastructure carbon management event, [Carbon Crunch](#). We have been convening the event

every year since 2013, to bring together a range of value chain members, to explore common challenges, share best practice examples and move the industry forwards.

Finally, I would highlight that standardising approaches to infrastructure carbon management is critical for supply chains to understand their role. Setting out the role of all value chain members is central to the PAS2080 Carbon Management in Infrastructure standard, which we co-authored and are globally accredited to.

## 2.5 As a business leader what do you think the biggest challenge is and how are you working to overcome it?

The urgency and pace of change required to deliver net zero creates a huge challenge for the industry, yet this urgency has also given the industry and society at large some much-needed impetus.

Delivering net zero requires a whole new set of skills and approaches, and there is a limited pool of industry experts with a proven track record in this area. Therefore, skills shortage is a risk for the industry. We need to move from a model where carbon management is viewed as a niche set of skills, to them being applied as business-as-usual across a variety of job functions.

At Mott MacDonald we have the advantage of having been leading on this agenda for some time, so are already some way along this process of mainstreaming skills, but do have further to go. Other strategies to addressing skills shortages are to apply smart, digital solutions, such that carbon management becomes more integrated and streamlined. Finally, the role that our Early Career Professionals (ECPs) have to play cannot be understated. The quality of our ECPs, their enthusiasm and their instinctive understanding of climate issues is a huge asset to our business and wider industry.

## **2.6 In your view what is the one innovation or change that is going to have the biggest impact on carbon or progress in our industry?**

There are multiple technological innovations that will have a huge role to play in delivering net zero, for example, hydrogen, electrification, Carbon Capture, Usage and Storage (CCUS), Bioenergy with Carbon Capture and Storage (BECCS), a massive increase in the uptake of Nature Based Solutions, development of low carbon construction materials, widespread adoption of circular economy principles or effective carbon pricing.

However, I'd choose to highlight the role that digital solutions will have in effectively tracking and managing carbon across a complex web of organisations and projects. The complexity of truly understanding the full lifecycle carbon impact of infrastructure decisions and delivery will increase significantly, particularly as Scope 3 emissions come under much greater focus and as the commercial incentives for verified carbon reductions increase. The data challenges with effectively managing this across major programmes, or at national or transnational scale, will only be effectively overcome by deploying digital ingenuity – and integrating carbon considerations into digital twins could be a massive part of the solution.



**Table 1: Mott MacDonald progress against the COnstructZero priorities**

	<b>COnstructZero Priority</b>	<b>Examples of Mott MacDonald progress and supply chain engagement</b>
<b>Transport</b>	1 Accelerating the shift of the construction workforce to zero emission vehicles and onsite plant.	Mott MacDonald supports and promotes lower carbon construction methods when working with contractors. Mott MacDonald JN Bentley has been <a href="#">trialling lower carbon fuels on construction plant</a> , with the potential to reduce emissions by 90%.
	2 Maximising use of Modern Methods of Construction and improved onsite logistics, reducing waste and transport to sites.	<a href="#">Project 13, DfMA</a> , Modern Methods of Construction, as set out in <a href="#">new dimensions to delivery</a> white paper.
	3 Championing developments and infrastructure investments that both enable connectivity with low carbon modes of transport and design to incorporate readiness for zero emission vehicles.	Champion the <a href="#">FUTURES</a> approach to vision-led strategic planning for an uncertain world. Delivered <a href="#">a place-based approach to net zero</a> through the net zero infrastructure industry coalition, exploring how local insight, capability and connectivity can help the UK towards a better, faster, cheaper net zero.
	4 Work with Government to deliver retrofitting to improve energy efficiency of the existing housing stock.	Part of <a href="#">UKGBC whole life carbon roadmap project</a> .
<b>Buildings</b>	5 Scale up industry capability to deliver low carbon heat solutions in buildings, supporting heat pump deployment, trials of hydrogen heating systems and heat networks.	Delivered <a href="#">the path to decarbonising heat</a> through the net zero infrastructure industry coalition, including three roadmaps for decarbonising heat (electrification, hydrogen, hybrid).
	6 Enhancing the energy performance of new and existing buildings through higher operational energy efficiency standards and better building energy performance monitoring.	Signed up to the <a href="#">World Green Building Council Advancing Net Zero commitment</a> .
<b>Construction Activity</b>	7 Implementing carbon measurement, to support our construction projects in making quantifiable decisions to remove carbon.	Developed the <a href="#">Moata Carbon Portal</a> lifecycle assessment tool. Implemented an instruction in our Business Management Systems to undertake a carbon assessment on all projects above a certain threshold. Provided evidence to understand the <a href="#">embodied impact of our national infrastructure pipeline</a> , through the net zero infrastructure industry coalition.
	8 Become world leaders in designing out carbon, developing the capability of our designers and construction professionals to develop designs in line with circular economy - reducing embedded and operational carbon, shifting commercial models to incentivise and reward measurable carbon reductions.	Led authored the <a href="#">Infrastructure Carbon Review</a> and co-authored <a href="#">PAS2080</a> . Achieved independent accreditation to <a href="#">PAS2080</a> for our UK business in 2017 and for our global business from 2019 onwards. Convened the annual <a href="#">Carbon Crunch</a> summit since 2013.
	9 Support development of innovative low carbon materials (prioritising concrete and steel), as well as advancing low carbon solutions for manufacturing production processes and distribution.	Championed the use of lower carbon material on projects, such as on <a href="#">Ordsall Chord</a> rail project. Explore lower carbon materials through low carbon innovation workshops across a broad range of clients. Collaborated with British Standards Institute and the Association of Sustainable Products Board to promote lower carbon materials at Carbon Crunch 2020.



## 3 Emerging leader interview: Bethan Hutchinson



Bethan is a carbon management consultant within the Mott MacDonald's energy business, and also our Early Career Professional (ECP) lead for sustainability and climate change for our UK and Europe region.

Bethan joined Mott MacDonald in 2019 as a graduate carbon management consultant, following completion of her Environmental Management for Business MSc. She also had prior experience within the group

sustainability function of a construction company, where she assisted with the development of sustainability strategies.

Since joining Mott MacDonald, Bethan has worked on a wide variety of projects, including supporting the development of a net zero roadmap for the Environment Agency, completing carbon assessments for Environmental Impact Assessments in the UK and internationally and strategic carbon reduction studies in the power, water and transport sectors.

In her role as a Sustainability and Climate Change ECP lead, Bethan had a leading role organising our internal sustainability week campaign. She was also pivotal in achieving our Group Carbon Neutral status, undertaking data analysis of the group carbon footprint to advise and implement Science Based Targets and assist with the certification of PAS 2060 (Carbon Neutrality).

### 3.1 What do your peers and wider employees within your company think about the businesses' approach to Net Zero?

I have had conversations with many of my peers who have highlighted that they are proud to work for a company that has already achieved carbon neutral status, and which has ambitions to become a net zero organisation by 2040, if not before. This pride stems not only from our position as leaders, but also in the fact that we are leading by example.

Our approach to net zero prioritises reducing our organisational emissions as far as possible, in line with climate science. This approach is something that we already champion on our projects, and by continuing to do so through driving and delivering solutions which mitigate carbon is something I feel my peers view as a valuable part of our net zero mission. However, the thing that most stands out to me is our willingness to challenge and be challenged.

Our approach to net zero goes much further beyond our internal commitments, but also extends to the projects in which we deliver. At Mott MacDonald we pride ourselves on connected thinking and recognise that the solution to such an emerging and cross-cutting issue requires dynamic conversations. I am therefore confident that my peers see the businesses' approach to net zero, whether that be at the organisational or project level, as something that has been crafted through informed and diverse conversations, but also as something that will continue to evolve as we continue learning and connecting.

### 3.2 How are the younger generation within your business engaged in this?

Here at Mott MacDonald, we have a strong network of Early Career Professionals (ECPs) who are recognised as a valuable resource within the business. Not only is this network drawn upon more casually, such as through Yammer conversations or Microsoft Teams discussion groups, but formal roles are also assigned. For example, there are a number of global and

regional Climate Change and Sustainability ECP lead roles, which are designed for the younger generation to be involved in supporting these key business development areas.

The ECP leads are also a key resource to continue the conversation with other ECPs, helping to create an ecosystem of knowledge sharing and networking. As a result, there are many opportunities for the younger generation to champion sustainable objectives such as net zero. Key examples are events such as our annual ECP, excellence and sustainability weeks which are spread across the year to help continually drive these conversations. The events provide the younger generation the opportunity to learn from experts, to showcase how they have delivered excellence and to open up conversations across the business. Our recent sustainability week consisted of 95 global sessions, primarily organised by our dedicated ECPs, and its success was a testament to the enthusiasm of peers across the business to share their pride of and commitment to sustainability at Mott MacDonald.

### **3.3 What more do you think your business could be doing against the 9 priorities?**

Mott MacDonald is already very active in addressing the CO<sub>2</sub>NetZero priorities, but I have identified some areas to develop further against each of the priorities.

#### **3.3.1 Accelerating the shift of the construction workforce to zero emission vehicles and onsite plant**

We should make it a requirement to design our projects with zero emission delivery in mind. This would encourage us to recognise the challenges involved (such as longer timescales) and generate early solutions. However, we should lead by example, and have a much more stringent policy on only using electric fleet vehicles for all our business travel.

#### **3.3.2 Maximising use of Modern Methods of Construction and improved onsite logistics, reducing waste and transport to sites**

Modern methods of construction (MMC) ultimately increase the efficiency of the delivery of projects when implemented. We should implement project specific targets for efficiency improvements to encourage the uptake of MMC. To help achieve these targets, we should have internal workshops and knowledge shares to highlight best practice and collaborate for innovation.

#### **3.3.3 Championing developments and infrastructure investments that both enable connectivity with low carbon modes of transport and design to incorporate readiness for zero emission vehicles**

We should produce even more thought leadership articles in this space to highlight our expertise and demonstrate more systems thinking approaches. We should be designing with a net zero economy in mind, and therefore evaluate all our projects against a set of criteria to understand if the project will be compatible with enabling net zero.

#### **3.3.4 Work with Government to deliver retrofitting to improve energy efficiency of the existing housing stock**

We should be championing this as an approach in line with PAS2080 principles and the carbon reduction hierarchy. Therefore, “build nothing” and “build less” solutions should be prioritised over new construction. To help key stakeholders see the benefits, we should provide studies into the whole life cost and carbon assessment benefits of retrofitting existing housing compared to a business as usual scenario, or the development of new housing stock.

#### **3.3.5 Scale up industry capability to deliver low carbon heat solutions in buildings, supporting heat pump deployment, trials of hydrogen heating systems and heat networks**

We should continue the great work we are doing in our net zero industry coalition and continue to publicise the outcomes of this work. The coalition should seek to continually grow and engage with more key stakeholders

across industry to understand challenges to solutions presented and work collaboratively to bring plans into fruition.

### **3.3.6 Enhancing the energy performance of new and existing buildings through higher operational energy efficiency standards and better building energy performance monitoring**

We could be doing more research and development into Passivhaus design and delivery. The buildings in which we help to design and deliver should be monitored to ensure they are performing as expected. We should help others to monitor energy performance by building a solution into our Moata digital services, to enable real-time monitoring of energy performance and compare this to projects of similar scope.

### **3.3.7 Implementing carbon measurement, to support our construction projects in making quantifiable decisions to remove carbon**

We should be making it a mandatory requirement to complete a carbon assessment on more of our projects, therefore changing the threshold in which this is required. As a result, we should further support our staff to have confidence in completing carbon assessments and recognising the mitigation measures to put in place.

To achieve this, we should utilise our existing carbon experts to train up a network of carbon champions across the business, supported by regular workshops to continue the conversation and address any challenges. As more projects include carbon assessments, we should continue to expand the functionality of our in-house carbon tool and work with teams to understand what further tools or libraries would help enable low-carbon decision making.

### **3.3.8 Become world leaders in designing out carbon, developing the capability of our designers and construction professionals to develop designs in line with circular economy - reducing embedded and operational carbon, shifting commercial models to incentivise and reward measurable carbon reductions.**

Although we already implement design for resource efficiency on our projects, we should make this a mandatory requirement in the early stages of all projects to encourage efficiency. We should recognise that a multitude of stakeholders should be involved in these workshops, not just design teams but also delivery teams or other members of the value chain, to better understand how one design change could impact other stages in project delivery. Design for resource efficiency workshops should look to include some of the key circular design guide resources that are available, to encourage more alternative approaches and creative thinking.

### **3.3.9 Support development of innovative low carbon materials (prioritising concrete and steel), as well as advancing low carbon solutions for manufacturing production processes and distribution**

We should actively design in the use of low carbon products and materials and be early adopters of new and innovative solutions. In many instances, not having an evidence-base is a key challenge in deploying innovative materials, therefore we should commit to developing trials and working with suppliers to demonstrate the challenges and develop effective solutions. Where low carbon, innovate materials have been used, this should be highlighted even more widely across the business.

### 3.4 A Youth Voice COP climate is being organised in Milan to bring together young people globally- what would be your key issue to raise?

The key issue I would raise attention to is the importance of urgent action. There has been a great amount of traction towards setting long term climate ambitions amongst businesses and government bodies alike, which is of course a necessitated and crucial step towards achieving net zero. However, setting goals and ambitions too far in the future risks becoming over-reliant on emerging technologies and deferring important steps and milestones that should be taken now.

I believe that challenging ourselves to deliver deep carbon abatement now will encourage us to consider how we can best draw upon the resources in which we already have available to us. This will help encourage the deployment of circular economy principles, to help maintain existing assets and ensure resources are kept within the value chain for as long as possible.

It will also help us look towards our natural environment and unlock valuable nature-based solutions. Developing nature-based solutions will be a key tool in not only delivering climate mitigation, but also climate resilience, biodiversity net-gain and positive social outcomes. Therefore, raising attention to the importance of acting now will help to foster a systems-thinking, collaborative and innovative approach to tackling the climate emergency.

### 3.5 What do you do in your daily life/job that makes a difference?

As a carbon management consultant, I am presented with the daily opportunity to not only help Mott MacDonald with our own carbon reduction commitments, but also help clients understand how their projects or operations can be delivered in line with what is required within the limits of our planet.

Within my role as the Climate Change ECP Lead for the UK and Europe, I am also committed to making others across the business aware of the good work that is being done across Mott MacDonald, and providing the support and resources needed to encourage others to consider sustainability and climate change outcomes in their daily roles.

On a more personal level, I feel like I am starting my career at a very exciting time for sustainability and climate change enthusiasts, given the emerging transition to a net zero economy and the innovation this brings. As a result, I like to push myself to continually learn from experts in the field, I like to attend webinars and read about various topics, such as natural capital, social outcomes and the circular economy, to help broaden my skill set and gain more awareness of how the work that I do fits into a system of other emerging priorities.

