



ace
Emerging
Professionals



Climate changing the built environment

October 2021

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The challenge

References to climate change can be tracked back to as early as 1856 when American scientist Eunice Foote stated in an academic paper, that an atmosphere filled with carbon dioxide, “would give to our earth a high temperature”¹.

Fast forward to the modern day, and the impetus surrounding the climate change agenda is clearly accelerating, with regular landmark legislation, including the UK’s Climate Change Act in 2008, the Paris Agreement in 2015, and the hopefully significant legislation that should follow in the wake of COP 26.

Despite nations around the globe committing to, “limit global warming to well below 2, preferably to 1.5 degrees”², it should come as no surprise to anyone reading this that as of today, we are failing in our collective international efforts to reduce greenhouse emissions and limit global warming.

The latest IPCC report shows global warming to be at 1.1 degrees and is forecast to reach the critical 1.5 degrees by 2040³, at which point severe climate effects begin to be seen across the globe. While emissions did fall as a result of the pandemic, this is simply not enough to limit future warming.

In the face of this, many are left feeling lost, confused and helpless as to how they can “do their bit”. Indeed, efforts to date have had little success, despite the 150 years of climate science showing a warming globe. However, younger generations are now synonymous with climate action and demanding change through movements like Extinction Rebellion and Greta Thunberg’s School Strike for Climate.

This report will shine the spotlight on how those working in roles across the entire built environment are tackling climate change in their day-to-day. Through a series of reflective testimonies we hope to provide an understanding of where/how we can all contribute towards mitigating climate change, and inspire others to act now with the understanding that, in Greta Thunberg’s words, “no one is too small to make a difference”.

Ahead of COP 26, the Association for Consultancy and Engineering’s (ACE) Emerging Professionals are asking the industry to share how is climate changing the built environment?

Who are we?

Formed to help the emerging generation of consultants and engineers working in the natural and built environments, ACE Emerging Professionals provide networking and career development opportunities across the UK.

They come from a broad range of consultancy and engineering disciplines, including: civil, structural, mechanical and electrical engineers, lawyers, architects, accountants, project managers, and cost consultants. They, of course, include representatives from ACE member companies.

Members range from those at the start of their careers to more experienced professionals, up to around 35 years old. They are ambitious, enthusiastic and keen to share their experiences with their peers.

ACE Emerging Professionals is currently sponsored by Mott MacDonald. The chair is Georgia Hughes of Arcadis.

¹ New York Times, Eunice Foote Obituary (2020), www.nytimes.com/2020/04/21/obituaries/eunice-foote-overlooked.html

² United Nations Climate Change, www.unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

³ Intergovernmental Panel on Climate Change (IPCC), www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf

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Net Zero and carbon





Stuart McLaren



Job title:
Technical director of Net Zero infrastructure

Company
Atkins

“
How has climate change changed my role? I can answer that in one word... completely.
”

How has climate change changed my role? I can answer that in one word...completely. My entire role now is focused on addressing the issue of climate change and it's worth noting that the role I currently hold did not exist in the business 18 months ago.

A change in legislation here in the UK in 2019, policy shifts in other countries, significant moves in global investor expectations, finance requirements and issues of brand reputation, have all helped to shift how we need to respond and support our clients to meet these new challenges and requirements across the built, digital and natural environment.

For me this has meant having to completely rethink what we do and how we do it. While there is a need for building new capability and deepening resource in some specialist areas such as carbon management, the big challenge has actually been in how we fundamentally change and make carbon visible through everything we do, enabling and empowering all our staff to be able to consistently and effectively deliver low carbon or Net Zero outcomes holistically for our clients.

I am not a technical practitioner in carbon or sustainability, and I believe that this is one of my greatest strengths in the role I hold. I bring no firm dogma or perspective to these challenges and approach all our clients problems with an open mind, effectively integrating what we already do well, to develop impactful solutions for climate change.



Tim Chapman



Job title:
Director of Net Zero infrastructure

Company
Arup

“
I’m not sure this is the right word but we live in exciting times! The pandemic has highlighted how the future of work, living and moving, is up for grabs.”

I’m not sure this is the right word but we live in exciting times! The pandemic has highlighted how the future of work, living and moving, is up for grabs. Meanwhile, there has also been a bold realisation of the magnitude, importance and urgency to tackle the twin crises of climate change and biodiversity loss.

The consultancy sector now faces the biggest dislocation in its existence – a need to radically shift from its old ways of doing things to provide the up-to-the-minute advice that its clients now desperately need, to pivot their operations to be fit-for-the-future. All the old certainties, techniques and processes have been rendered obsolete. Whole organisations will need to learn fast and devise new services just to survive, never mind thrive.

All consultancies are now reorganising furiously to better face these important challenges. At the same time as altering their service models, they are in a critical fight for talent – those with more experienced talent that will augment their existing services with critical new wisdom. Meanwhile, fresh consultants with different mindsets capable of assimilating all the new knowledge and applying it in ways that enable them to learn and develop their careers alongside their employers.

As the pan-industry body which represents consultants, the **Association for Consultancy and Engineering** (ACE) is also rising to this challenge, and by assembling these testimonials will examine what is changing and enabling consultants to share common best insights in their fight to not only remain relevant but help guide their clients towards a climate resilient and Net Zero future.



Tom Worthington



Job title:
Sustainability and carbon consultant

Company
Atkins

“
As the momentum behind the climate agenda continues to grow, jobs such as mine have become more common place. ”

As the momentum behind the climate agenda continues to grow, jobs such as mine have become more common place. My role is to help our clients reach their sustainability objectives, whilst being an ambassador for environmental performance and carbon literacy.

I work with clients such as **Highways England, Network Rail, Environment Agency**, developers and local authorities. It is empowering to see that so many organisations are realising that, with the right help, achieving their environmental ambitions can be possible and I think it is an exciting reflection of the times to see the breadth and variety of projects the team is working on.

Two of our core service lines within the sustainability team are Net Zero strategy and carbon management. Our strategy work helps organisations to understand their carbon footprint, the existing legislation and guidance driving the industry and plot a route to achieving their commitments and ambitions. I find this really interesting as it requires me to approach the various stakeholders holistically, understand how the client operates and review a wide variety of business functions and activities from a sustainability perspective.

This work has great synergy with our carbon management service. Here we analyse specific projects and through industry-leading digital tools, steered by professional standards, review the entire life-cycle to identify carbon hotspots and work with clients to implement innovative solutions to minimise their carbon footprint.



Amer Obeid



Job title:
Senior energy and carbon consultant

Company
Jacobs



I have been rebuilding my career in a new direction, one that I hope can contribute to solving one of the world's biggest problems.



As a senior energy and carbon consultant, my role involves designing low carbon pathways for our energy systems. This means working with clients such as the **Welsh Government**, **Transport Scotland** and **Irish Water**, to identify and map the feasibility of emerging low carbon technology and to enable their potential. I find my job to be rewarding, interesting and enjoyable, as I get the opportunity to work with a range of different clients, solving an array of problems – though always focusing on the overarching challenge of preventing runaway climate change.

As governments and organisations look to address this challenge, my role continues to develop. While this change has been considerable in just the last eighteen months, for me the question isn't just how climate change has changed my role, but how climate change has changed my entire career.

As a chartered engineer with over a decade of experience I have worked in a number of different industries, principally in oil and gas. Prior to my current role, I spent many years developing my career in that sector and I was happy on my chosen path. At first, I ignored the reality of the climate crisis, but over time I did engage with the science.

I left my job at the time to go back to university, gaining a masters in renewable energy and clean technology. From that point, I have been rebuilding my career in a new direction, one that I hope can contribute to solving one of the world's biggest problems and while my personal transition has been hard at times, I find my new career incredibly satisfying.

Whole-life cost

The background of the image is a photograph of a modern building with a glass facade and a walkway lined with trees. The entire image is overlaid with a semi-transparent orange filter. The text 'Whole-life cost' is written in white, bold, sans-serif font in the upper left quadrant.



Janine Garvie-Cole



Job title:

Associate – whole life cost leader

Company

Arcadis

“
With urban residents accounting for more than 70% GHG emissions, cities are vital to solving the climate challenge. ”

work within our asset optimisation cohort, across various public and private sector accounts. The focus on totex and opex has been an increasing conversation across a multitude of sectors, though in recent years the ESG agenda has particularly focused on mandated Net Zero carbon reductions, key in tackling the climate crisis.

Whilst it used to be commonplace to have those conversations at the concept design stage of project – where often the greatest level of whole life cost efficiencies can be achieved – we are now increasingly seeing Net Zero carbon and sustainability as key drivers for retrofit projects, paramount to public sector clients, for example, who often have large and disparate estates, of varying age and condition.

We are also moving beyond the take-make-waste model based on short-term needs towards a circular economy approach, and supporting our clients facing large bills from obsolete components at the end of their usable life that cannot be replaced. This is achieved via the incorporation of whole life cost at the earliest opportunity, and a gear-shift away from the once silo mentality of capex and opex as standalone revenues without any interdependency.

With urban residents accounting for more than 70% greenhouse gas emissions, cities are vital to solving the climate challenge, and it is thought that the well-off urbanites will need to reduce consumption-based CO₂ emissions by two thirds by 2030 in order to stay on track to limit global warming, with over 10,000 cities having made commitments to reduce carbon emissions by 2050.

Renewable energy





Richard Caselis de Pury

in

Job title:
Systems design Engineer

Company
Siemens Energy

“
Now in my first job,
I am aware that
my role would not
have existed 15 or
20 years ago.”

At university I decided to specialise in renewable energy and focus my studies in the hopes of working in a career that was stimulating whilst ethically and morally rewarding.

Now in my first job, I am aware that my role would not have existed 15 or 20 years ago. The team I work in was established to provide consultancy to wind farm projects across the world. I return wind farm electrical designs to developers, along with assurances that it will meet the stringent requirements set by the grid code in the region where the wind farm connects.

The UK Government established the *Contracts for Difference* scheme in order to increase the amount of renewable generation in the grid to encourage the move towards Net Zero. This financial mechanism enables renewable energy developers to guarantee their earnings for years to come, thereby allowing them to secure the loans and investment required for a £1billion+ project. Since the introduction of the scheme, the strike price has decreased dramatically from around 80 £/MWh in 2015 to 40 £/MWh in 2019 – approximately equal to the wholesale market average.

As wind energy has become increasingly common, there is a growing demand for ancillary services to the grid as renewable energy sources decrease network strength and can cause grid instability. To ensure that the penetration of renewable sources can increase further, and we as a nation can achieve Net Zero, it is essential that a stable grid can be maintained at all times.

Water and utilities





Ben Izzett



Job title:
Program leader

Company
Suez Water Technologies & Solutions

“
At a personal level it is influencing the content I include in the programs I am responsible for. ”

As part of the *Shaping SUEZ 2030* plan launched in 2019, **SUEZ** made three key environmental commitments: to reduce by 45% the direct and indirect greenhouse gas emissions from our activities by 2030, to help our customers avoid 20 million tonnes of CO₂ emissions a year by 2030, and offer 100% sustainable solutions.

These commitments and growing awareness of the impact of climate change are shaping our actions. At a global level we are deploying a Passion for the Environment Fresco to all our employees to drive greater awareness of climate change and pollution.

At a personal level it is influencing the content I include in the programs I am responsible for. During our most recent graduate programme, I incorporated a sustainability project as the final element. The aim was to bring sustainability to life and provide an opportunity to use the essential skills our graduates had developed.

We introduced our graduates to an entrepreneurial method and split them into teams linked to their shared passion for specific Sustainable Development Goals SDGs. Each team was tasked with developing a sustainable business solution that would make a meaningful impact. A wide range of solutions were developed linked to membrane rejuvenation, lemon trees and the wine industry.

Importantly, each of the five business solutions that were developed will be implemented or used to enhance existing sustainability projects. It is becoming more and more important to provide actionable tools to our employees if we are to make a collective impact against climate change.



Pat
Horne

Job title:

Head of strategy and commercial

Company

United Utilities



Throughout my career it has been both interesting and rewarding to work on decarbonisation to support mitigating climate change. ”



I have worked in the utilities sector for over 25 years. Throughout my career I have worked on developing low carbon outcomes to support decarbonisation and mitigate the impacts of climate change.

Initially I was in R&D producing “green fuels” and cleaner combustion systems. Following this, I worked in a major energy generation project development focusing on natural gas and renewable solutions. I then moved into energy systems from source to end use. This led to directing a range of projects and initiatives – from strategy development for organisations to decarbonise, continuing to develop green generation solutions and organisational energy / carbon optimisation programmes.

As my career progressed, I moved into roles focusing on leading operational energy and carbon consultancy teams, working internationally. In 2018, I joined **United Utilities** as their chief energy engineer and have recently moved into a role as head of strategy and commercial covering bioresources, energy and carbon which provides great diversity, including how we, as a company, develop our 25-year strategy, through to the planning and delivery of projects and initiatives.

As the UK accelerates its Net Zero ambitions, the opportunities to decarbonise are becoming more integrated across transport, heat and electricity, and require greater collaboration. Throughout my career it has been both interesting and rewarding to work on decarbonisation and support mitigating climate change. It feels like the next decade will be full of challenges and opportunities as we deliver a Net Zero future.



Suyaraj Thiruchelvam

in

Job title:

Global new asset design leader

Company

Suez Water Technologies & Solutions



Compared to only a couple of years ago, the team is now discussing sustainability, efficiency and low energy systems routinely in our designs, which is a great sign of awareness across the engineering sector.



It is brilliant to see strong leadership from **Suez** through our strategic plan, *Shaping 2030 SUEZ*, which aims to firmly establish the group as a world leader in environmental services by 2030.

To better fulfil the environmental needs of its customers, Suez will increase smart and added-value solutions in order to offer a unique proposition centred on health and wellbeing, quality of life, and on a circular and sustainable economy which reduces our customers' emissions while preserving and restoring the planet's natural capital.

On an individual level, I am leading a global team to design and build mobile water treatment assets for Suez Services Business unit across the globe. Compared to only a couple of years ago, the team is now discussing sustainability, efficiency and low energy systems routinely in our designs, which is a great sign of awareness across the engineering sector and makes a small contribution towards Net Zero.

I am also member of the **Institute of Water** and take particular interest in their reports and seminars on sustainable designs and Net Zero initiatives in the water market. I am keen to learn more about this topic to increase not only my own awareness, but that of my team too.

Outside of work, I engage with many sustainable hobbies, such as DIY and gardening and implement many low carbon practises including: LED lighting, reduction of single use plastics, proper waste separation and disposal, minimising car travel, choosing eco-friendly cars, appliances and heating.



Suzy Hill



Job title:

Graduate

Company

United Utilities



We have also kicked off conversations around the importance of carbon literacy and are now creating educational content for our employees to ensure that we have a companywide understanding of carbon emissions.



Since joining the **United Utilities** graduate scheme in 2019, I have worked in five different roles across the business: process excellence, capital projects, production planning and wastewater operations. In these two short years, the conversation around the climate crisis has been amplified considerably, both within the workplace and on the news and at home.

As a graduate who frequently changes teams, my perspective may be slightly different to others. Each placement had links to decarbonisation, but most notably the focus on energy efficiency has been consistent across all roles. For example, I have been part of a pilot to optimise repair work and outages across a water production area.

Graduates at United Utilities also get involved in the CEO challenge which is run each year. We are split into multi-disciplinary teams and tasked with solving an important business challenge – this year we covered asset health, biosolids to land, and strategising Net Zero. Our team was tasked with developing a Net Zero roadmap for the company, alongside the long-term strategy and processes for engineering teams.

We have spent the past nine months engaging employees, increasing our emissions and modelling capability, as well as quantifying the carbon benefits of planned and innovative technologies.

We have also kicked off conversations around the importance of carbon literacy and are now creating educational content for our employees to ensure that we have a companywide understanding of carbon emissions, what it means to reach Net Zero, and how employees can get involved.

Transportation





Gareth Williams

in

Job title:
Head of sustainability

Company
Avanti West Coast

“
Rail, as one of the most sustainable means of mass transport, has a huge role in reducing the nation’s carbon footprint.”

Rail, as one of the most sustainable means of mass transport, has a huge role in reducing the nation’s carbon footprint. The Climate Emergency has raised the profile of the work I do substantially with my role only being created a few years ago. I am responsible for the creation and delivery of the companywide Sustainable Development Strategy, which includes a goal of becoming Net Zero carbon by 2031.

The work is extremely varied as I get to engage with a wide range of internal teams, external consultancies as well as industry colleagues to share best practice. For example, I am currently working with our Station Development Team and **Network Rail** to deliver a solar panel car port. I’ve also been working closely with our Fleet Engineering teams on introducing a Climate Train designed to be a test bed for innovative initiatives to improve energy efficiency. I also work with a lot of data to calculate our carbon footprint to inform our decision-making.

Anyone wanting to make a real difference and be proud of what they do, then the rail industry is for you. The roles and opportunities are varied whether you work for a train operating company like **Avanti West Coast**, or the infrastructure owner Network Rail. Energy efficiency on a train or a station is important, but smarter use of materials in design and construction is also essential if we are to drive out carbon emissions, and that needs enthusiastic, problem solving, engineering-led minds.



Andy Yates

in

Job title:
Aviation technical director

Company
Atkins

“
It’s important to me that I contribute to how aviation, an industry I’m passionate about, addresses its climate challenge. ”

Climate change has broadened the scope of my role as an airport planner. I work with airports and infrastructure investors globally to help them understand how best to meet ambitions on longer term growth, develop new infrastructure, optimise the use of existing assets, and advise on creating financeable investments.

Passenger experience, revenues and cost, would previously have driven how an airport might expand or change. Now, the impact on the environment is given just as much, if not more, importance.

I now need to consider many other aspects and thinking when advising airports, bringing in other capabilities such as advising on thermal strategies, embedding low carbon design in decision making, sustainable utilities strategies, or surface access strategies to encourage more sustainable travel to airports. All of this while continuing to test whether new build solutions are required at all, and if they are, how to build in a more efficient way.

Aviation has made important steps in recent years in addressing climate change and clearly there is much more work to do in becoming a Net Zero industry by 2050. It’s important to me that I contribute to how aviation, an industry I’m passionate about, addresses its climate challenge, and that’s through thinking differently and more broadly to develop solutions. Plus, I am continually learning new things from my sustainability colleagues!

Academia and R&D





Amer Gaffar



Job title:

Director of the Manchester Fuel Cell Innovation Centre

Company

Manchester Metropolitan University

“
In the last 18-24 months we have seen a real shift change, in part driven by legislation and a policy focus on delivering Net Zero. ”

I have been involved in the low carbon sector for around 20 years now, 10 of those within my role at **Manchester Metropolitan University**. In the last 18-24 months we have seen a real shift change, in part driven by legislation and a policy focus on delivering Net Zero. The legislation and policy standards that have been asked for, and pushed for, by both the private and public sectors have introduced new methods and procedures for businesses looking to unlock R&D and infrastructure spending.

My role involves working with local, regional, national and international stakeholders on projects that use innovation to achieve Net Zero through developing hydrogen and fuel cell technology. Our research team provides evidence to governments, SME's and the industrial sector of the role of hydrogen and fuel cells.

A strong contribution we can all make is really understanding Net Zero, which will allow us to make the necessary contributions in our personal and professional lives to allow a real shift change to occur and for the correct investment decisions to be made. This will allow us to collectively tackle climate change. An agenda like this will only happen through collaboration and ensuring people have the right skills to achieve our ambitious, but critical, Net Zero agenda.



Chris Kinally



Job title:

PhD student

Company

Tyndall Centre for Climate Change Research



The Tyndall Centre's vision is to “provide evidence to inform society's transition to a sustainable low-carbon and climate resilient future”.



I work at a climate change research centre, so for my colleagues and I, climate is at the core of everything we do. The **Tyndall Centre's** vision is to “provide evidence to inform society's transition to a sustainable low-carbon and climate resilient future”. We have strong links with policy makers and industries within the UK and internationally.

I'm an environmental engineer. My three-year research project aims to create a strategy to address the toxic waste flow from off-grid solar products in Malawi, and more generally across sub-Saharan Africa. Typical for climate change related studies, my research is multi-disciplinary, covering fields such as circular economy, public health, anthropology, climate change mitigation and adaptation, national electrification policy, and sustainable development. This involves a broad range of stakeholders including governments, off-grid solar product producers, recycling companies, and vulnerable groups such as energy poor off-grid solar product users and members of the informal waste management sector.

Malawi's livelihoods and the agriculturally based economy are already significantly affected by climate change – the increasing severity and frequency of climatic shocks poses a threat to the country's stability. The essence of my research is to provide key decision makers with evidence-based policy recommendations, so that the uptake of off-grid solar does not have excessive negative environment and socioeconomic impacts through the spread of toxic waste into densely populated communities. I love my job because I have the freedom and support to become an expert in issues that severely impact people's lives, and to be able to use my expertise to make a difference.



Dr Jaise Kuriakose



Job title:

Lecturer in energy and climate change

Company

University of Manchester

“
Climate change is a multifaceted problem that requires cross-disciplinary collaboration and engagement.”

In my current role I teach renewable energy topics and research the accounting of carbon emissions and various solutions for transitioning to a low-carbon society.

Climate change is a multifaceted problem that requires cross-disciplinary collaboration and engagement. Fundamental changes to our infrastructure and energy use are needed to mitigate climate change.

Since 2016, my work has been largely at the interface of science and policy, collaborating with various local/regional and national governments to help set climate change targets that align with the Paris Agreement.

Although trained as an engineer, working with policymakers enabled me to translate evidence-based research into a clear narrative to guide policy. Policymakers need easy access to the science in a format that is tangible, with sufficient data to make timely decisions – it is vital to work to tight deadlines, while addressing various stakeholders’ sensitivities, to be successful in policy-related work.

Engineers have a great opportunity to pursue a career in sustainability and to be part of solving this grand global challenge of achieving net zero emissions. In my experience working in the field of climate change makes me feel motivated and gives me a sense of appreciation.

Future skills





Dr Lara Potter



Job title:
Partner and director

Company
Arcadis

“
I found a joy in bringing multidisciplinary teams together to solve some of the trickier problems.”

I loved the technical discipline of my civil engineering undergraduate studies, and the opportunity to work outside, onsite. Being curious about industrial impacts on the environment, my PhD then took me into environmental engineering.

Since then, I have spent the majority of my career working with global industrial clients, including the oil and gas majors, managing and mitigating environmental and human health risk associated with current and legacy operations. As I took on the leadership of more complex projects, I found a joy in bringing multidisciplinary teams together to solve some of the trickier problems.

In my current role at **Arcadis** I lead a workforce planning team – helping to guide our business and support our employees in finding the right opportunities whilst steering us towards the skills for the future. It is only through the use and application of digital technologies that we will be able to deliver improved social and environmental outcomes.

I am proud to be a member of the board and chair of the Future Skills group for the **Association for Consultancy and Engineering (ACE)**. Thanks to this working group I have been able to share some of our knowledge with wider stakeholders.

My concern for our environment has also focused on my local area as I have spent more time at home over the past year. As a result, I lead a local environmental group which is focussed on sharing knowledge and perspectives around the climate crisis and improving the condition of our local river – for people and the environment.



Emma Dickson



Job title:

Technical director, Skills chair

Company

Arcadis, Construction Scotland



We need everyone from the user, client, designer and constructor to understand which infrastructure solutions will effectively deal with climate change



We need everyone from the user, client, designer and constructor to understand which infrastructure solutions will effectively deal with climate change, and through collaborative working across the industry, address Net Zero carbon throughout the project life-cycle.

At **Arcadis**, we have been managing carbon for many of our infrastructure designs, mostly in response to client demand, but emerging legislation and increasing understanding means we are in a position to do much more.

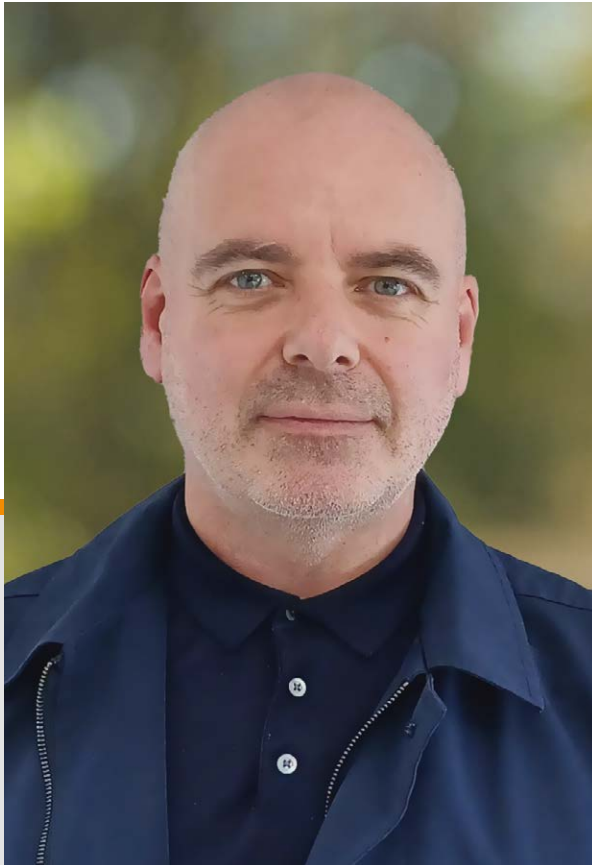
We need to get better at encouraging young people into engineering as they are the future of our industry and solving the climate challenge. As climate change is on the tip of everyone's tongue, it should be an easy recruitment drive.

In the early 90s I started out in construction on major road building projects across the UK, and even then, the impact of pollution was obvious, as well as the effects on landscape and natural habitats. Following rail privatisation, passenger numbers doubled, so I found myself working on more rail projects to lessen the need to take the car.

I have also overseen: a climate-resilience dam remediation project and the construction of the civils elements of a biomass plant; low carbon energy projects continue to challenge engineers and are extremely interesting and rewarding. I managed temporary works on the **Dublin Port** tunnel project which will remove up to 9,000 trucks from the city quays which caused congestion and pollution.

Civil and structural engineering





Phil Hughes

in

Job title:
Technical director

Company
Curtins

“
I never quite realised how many individuals are genuinely passionate about the environment and the impact their designs can have.
”

I am a chartered engineer and have a national risk and compliance role within our business. The company is certified to ISO14001:2015 and is an advocate for all matters environmental, but in recent years I have felt obliged to improve awareness through greater stakeholder engagement.

Energy Saving Opportunity Scheme (ESOS) legislation, and our requirement to comply, has also generated thought provoking data and encouraged us to reflect on our operations with a view to reducing our footprint.

Consultation with our people has produced astounding results. I never quite realised how many individuals are genuinely passionate about the environment and the impact their designs can have. Our people are now regularly approaching me with ideas for continual environmental improvement. I'm delighted to see that environmental matters are now given the same degree of prominence as health and safety or quality. Education and training are key and what is refreshing is our people are asking me for it.

Clients are setting benchmarks for sustainable design solutions and those not fully engaged in the cause appear to be more receptive. The realisation of true design innovation is happening due to the commitment of our people, not simply due to legislative impositions. We have the ability to demonstrate the carbon footprint of our designs and the impact different materials or construction methods have on the environment so that our clients can make informed choices on their developments.



Rhys Jones

in



Rob Wood

Job title:
Civil engineers

Company
Burroughs

Civil and structural engineering

“
As civil engineers,
changes to legislation
and standards are
influencing day-to-day
practices for the
better.”

Working as a civil engineer allows involvement in a range of civil and infrastructure schemes, from water infrastructure, highway and car park improvements, to drainage networks.

Rising rainfall and the frequency of extreme storm events due to climate change means that flood mitigation, sustainable drainage and management of water resources are increasingly important aspects to all civil engineering projects.

Climate change has accelerated changes in legislation and standards. These challenge engineers, contractors, and project teams to think about how we can maximise the benefit of water as a resource. Along with other criteria involving water quality, hydraulic control, operation, maintenance and providing amenity and biodiversity to the environment are all required for successful drainage applications.

The legislation dictates that UK water companies are now obliged to suitably maintain various sustainable drainage systems (SuDS) features as part of their surface water network on new developments.

As civil engineers, changes to legislation and standards are influencing day-to-day practices for the better. The impact of the new legislation has meant that traditional approaches of discharging surface water into sewer infrastructure, is firmly an option of the past. The outcomes should result in reduced surface water volumes treated in sewage treatment works, reducing energy consumption, and freeing up a valuable resource to be used in a better way.



Will Arnold



Job title:
Head of Climate Action

Company
Institution of Structural Engineers

Civil and structural engineering



I felt that I could have more impact on the future of our profession if I took my design hat off for a bit and focused on doing what I could to decarbonise our industry. ”

I was as a practising structural engineer at **Arup** for almost a decade before I first considered the impact on the planet of what I was doing. I'd always had an interest in working on projects where technical competency and social usefulness met, but I had never really given too much thought to the magnitude of the emissions that I was responsible for.

Early in 2020, I was invited to join the Institution's Climate Emergency Task Group (CETG), and eventually became a part-time member of institution staff, balancing the role with commitments at Arup.

I started with the responsibility of generating guidance for practising structural engineers around everything to do with the climate emergency – calculating carbon, reducing carbon, the role of refurbishment, circular economy, questioning the brief. I would work out what topics needed writing on, search out the best experts I could find to produce guidance, and work with them to make it clear, concise and accessible.

We've now produced around 50 guidance notes, all available free to anyone who wants them at our website.

As time went on, I found myself drawn into more cross-industry conversations, where I discovered that what we were doing at the **IStructE** was right at the front end of industry progress on the topic. As a result, I felt that I could have more impact on the future of our profession if I took my design hat off for a bit and focused on doing what I could to decarbonise our industry.

Legal





Oliver Spencer

in

Job title:

Solicitor

Company

BDB Pitmans LLP

“
Climate change is increasingly central to decisions on infrastructure development.”

As a planning lawyer specialising in major infrastructure proposals, including new transport and energy projects, climate change is increasingly central to decisions on infrastructure development. Proposals for major infrastructure will play an important role in achieving the government’s Net Zero targets.

For the biggest types of infrastructure proposals – known as nationally significant infrastructure projects, or NSIPs – the policy landscape is shifting.

With national policy statements now out of date, including in relation to Net Zero, it has led to some uncertainty. However, the Government has recently confirmed that some NPSs are being reviewed, which should provide new clarity.

Another way in which climate change has changed the way in which I work is that in the past few years, the rules relating to environmental impact assessments have been amended to require the climate change effects of new projects to be assessed specifically. This has led to increased complexity as the effects of individual projects in terms of carbon emissions must also be considered cumulatively with other projects which can make the decision-making process more difficult.

Climate change is becoming a pervasive topic across all aspects of new infrastructure, from scheme design, public engagement and consultation and planning policy compliance, and I look forward to continuing to grapple with the challenging and interesting issues that it can give rise to as part of my day-to-day work.

SMEs





Azhar Quaiyoom

in

Job title:

Director

Company

Q Sustain

“
Awareness has increased, demand for our experience and services has also increased, as well as support for our objectives.”

This may not be the conventional response received from many, but climate change has not changed my actual role significantly! Most of my work over the last 10 years has been to reduce carbon and energy, improve air quality, and increase waste recycling and biodiversity in the quest to tackle climate change.

What has changed is that awareness has increased, demand for our experience and services has also increased as well as support for our objectives.

We are finding many guidance papers, and standards also being published at a faster rate than before to help achieve our legally binding target for Net Zero and that many local authorities are aiming to better. Tools have also improved in calculating embodied and operational carbon and greater data and analytics is being captured.

Our clients are also more involved and supportive and want to boost their sustainability credentials and performance. This has led to an increase in our involvement at early design stage as well as implementation. Our services in checking and assurance have also increased with both new and existing clients.

While expected, it needs to increase across the industry if governments are serious about curbing the impact of long-term climate change, the effects of which we are every increasingly witnessing, making our role busier than ever!

Industry leadership





Jordan McGlacken

in

Job title:

Chair

Company

ACE North West Emerging Professionals

“

The emerging generation of engineers and consultants are passionate about climate change.

”

I'm chair of the ACE North West Emerging Professionals (EPs) group, although I will have moved on from the role by the time you are reading this.

One of the first initiatives we delivered after I became chair was a webinar providing emerging professionals with an introduction to Net Zero. At the time, I was coming across the term frequently, but did not really know what it meant to me and my work.

Through this experience, I reached out to people I never would have, and nearly always was responded to with enthusiasm and passion. I learned a lot from the discussions that led up to the event – maybe even more than the event itself – and to this day come across insightful posts about sustainability and the environment on my LinkedIn from these same people.

Even between that first webinar and now, I feel the push towards Net Zero has accelerated. I see new, sustainability-focused roles created, a growing need for governments to support green investment across the UK, and experience more stringent regulations and policies in relation to sustainable development in my day-to-day work as a civil engineer.

Engineers and consultants play a key role in shaping our built and natural environment. On the same hand, the emerging generation of engineers and consultants are passionate about climate change. It is important for me, and for those I work alongside, to fully realise where we are, and where possible take advantage of the opportunities that will help us deliver a Net Zero future.



Dr Sarah Prichard



Job title:

Partner & UK managing director

Company

Buro Happold



It has become a major feature of my everyday work and I now feel that I'm doing all I can to make the world a better place. ”

I wanted to do something to help make the world a better place...and chose a career in civil and structural engineering! My noble aspirations sustained me through my education, but on starting work, I quickly became seduced by creating an incredible portfolio of buildings in the UK and abroad, and loved working with clients and collaborators on unique projects.

Buro Happold has always prided itself on aiming to “touch the earth lightly” in its engineering work. However, while sustainability was important, it didn't guide all our decisions. Things changed radically in 2019 when climate change was formally recognised as, “the biggest crisis humanity has ever faced”.

Engineers, like me, realised that they could make a real difference through their work, and colleagues led the way in the creation of the **Engineers Declare** movement.

Buro Happold made a series of bold statements on how we would pivot our business to ensure that we considered the climate emergency in our own operations and approaches. Although I'm not an expert on sustainability or the path to Net Zero, as UK managing director, I feel responsible driving our business to achieve these aims.

I also ensure that our engineers and work winners are trained and supported to focus on shifting the dial to a lower carbon future, both in operational and embodied carbon, as well as in the engineering work we lead. It has become a major feature of my everyday work and I now feel that I'm doing all I can to make the world a better place.

Final thoughts...

The testimonials from across the industry present a very apparent sense of awareness, urgency and action on the issue of climate change.

Everything we do in the built environment drives emissions. In a Net Zero future, everything has to be different and it would be unreasonable to expect transformative changes to the consultancy and engineering sectors overnight. We are yet to feel the full effects of the June 2019 amendment to the Climate Change Act (2008), but as **Tim Chapman** (Arup) said in his testimonial, “we live in exciting times” and it is encouraging to see multiple testimonials referring to the effects this legislation is having on their businesses and evidence that strong policy can make a difference.

To turn the tide on runaway climate change, we will need many more professionals working in this space to champion Net Zero and a carbon free future – everyone from students, graduates and apprentices, all the way up to senior leadership. Those leading on projects have additional responsibility to deliver sustainable solutions across the whole project life-cycle that are fit for the future and don't ‘cost the earth’.

For those breaking into the industry it will hopefully be empowering to read that people of all backgrounds can, and are, making quantifiable contributions in a diverse range of job roles. You do not need to be an environmental specialist to ‘do your bit’. Furthermore, no matter your position, it is never too late to steer your career path to support the climate change agenda and the testimonials within this report certainly suggest it will be a personally rewarding choice.

Within the next five years, we can expect to see a great deal more activity within this space. The 4th carbon budget comes into effect from 2023, which we are currently off target towards meeting, and requires a far greater carbon reductions than in previous budgets⁴. **COP 26**, in November 2021 will pivot the UK and the globe into a new age of climate action. Furthermore, many large organisations, are setting ambitious targets of being Net Zero by 2030, which will require an enormous effort to achieve, with time already running out. Meanwhile, throughout this time the UK Government will enact its £12 billion *Ten Point Plan for Net Zero* which promises to deliver the investment required to achieve our decarbonisation goals and create up to 250,000 green jobs⁵.

Considering the scale of transformative change required, it can feel challenging to understand how we can personally contribute. However, it is important to understand the impacts of our own sphere of influence and where we can all make a difference. Where do you see yourself contributing towards minimising climate change within your organisation now and in the future? How can you maximise on the opportunities? Has this report inspired you to propose ideas for your own business? Who in the stood out to you and why? For those considering job opportunities, has this report supported decision making? The time for action is now.

This report started by looking back on the past 150 years of climate science and asking how is climate changing the built environment. However, with global warming rapidly rising and most of the difficult actions ahead of us, it only seems fitting to now look forward for an industry-wide response and ask, how will the built environment change our climate?

⁴ Committee on Climate Change, Advice on reducing the UK's emissions (2020), www.theccc.org.uk/about/our-expertise/advice-on-reducing-the-uks-emissions

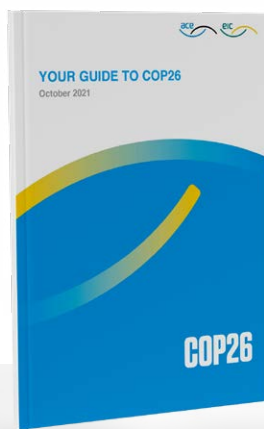
⁵ Ten Point Plan for Green Industrial Revolution (18 November 2020), www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution

Acknowledgements

We would like to thank those who have taken the time to provide testimonials in support of this project. You were all approached due to our awareness of the incredible work you are doing towards addressing climate change and we hope you too are proud of this output, which will elevate the ongoing industry response on the issue and hopefully inspire others to act and follow in your footsteps.

Much of the report is framed around climate action and the work you have all done to date, but with so much still left to tackle climate change, we will be extremely interested to see where your careers take you over the next decade and what achievements you will accomplish in addressing this global challenge.

Thank you.



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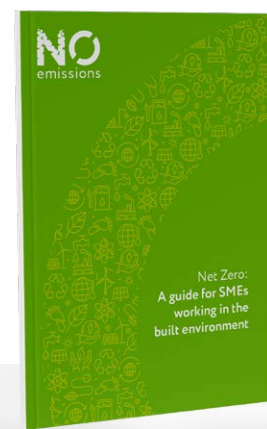
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