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INFRASTRUCTURE Intelligence

Building a greener world

A net zero special issue

ATKINS
Member of the SNC-Lavalin Group

Published in association with Atkins

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Message from the editor

Welcome to this special digital edition of *Infrastructure Intelligence* on net zero, which we're delighted to be publishing in association with Atkins to coincide with the COP26 climate change conference taking place in Glasgow from 1-12 November 2021.

Climate change is an issue that has catapulted to the top of the political and social agenda in recent years. For the construction and infrastructure sector, it's clear that no project - however large or small - can be contemplated without taking account of the net zero agenda. That's entirely correct of course, especially when you consider that the built environment and construction accounts for 38% of global carbon emissions.

Most of the decisions made by world leaders at COP26 will have a direct impact on our industry. It is absolutely right then that an industry that will shape the world of tomorrow should be seen as a crucial player in the global race to net zero. And it's no exaggeration to say that the leaders of our industry have a key responsibility, not only to shape the future, but also to engage with politicians, NGOs and business leaders to ensure that they receive the best possible advice and assistance to help them make the right decisions.

This net zero special edition of Infrastructure Intelligence highlights and showcases some of the brilliant work that is taking place around sustainability and net zero and discusses some of the key issues that we need to address as an industry to create a better world.

I hope you enjoy the read.

Andy Walker,
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Industry must lead way on climate change

The construction and infrastructure sector will play a decisive role in implementing the key decisions made by world leaders at the COP26 conference in Glasgow, *writes Infrastructure Intelligence editor Andy Walker.*

It is no exaggeration to say that few industries will be able to turn the commitments made at COP26 into action quite like the infrastructure sector. The built environment and construction sectors account for 38% of global carbon emissions. As such, any decisions reached at COP26 will eventually impact on our industry so it stands to reason that, as the designers of the world of tomorrow, the industry that shapes it will be crucial in the global race to net zero.

Put simply, the leaders of our industry have a critical responsibility not only to shape the future but also to engage with politicians and other opinion formers to ensure that they receive the necessary assistance to help them make the right decisions.

The stakes are high

Like never before, COP26 gives the global infrastructure industry an international platform to show that it has the answers to some of the most urgent challenges facing humanity. The stakes are that high and now is not the time for our leaders - both business and political – to shirk from their responsibilities. They need to step up to the plate, stand up and be counted and show bold leadership by their actions and commitments in tackling climate change and mapping out an achievable strategy to achieve net zero.

The UN has set four global goals for COP26. It wants to secure global net zero by mid-century and keep the 1.5 degrees climate target within reach. At the conference in Glasgow, countries are being asked to come forward with ambitious 2030 emissions reductions targets that align with reaching net zero by 2050. These targets will need to be framed in such a way that ensures that the industry can turn them into real and achievable actions.

Secondly, the UN wants countries to take action to adapt to protect communities and natural habitats. The climate is already changing and will continue to change, even as the world reduces emissions, often with devastating effects. So, COP26 will need to see tangible outcomes from decision-makers that will help to ensure that adaptation and resilience is achieved, especially for some of the poorest communities most affected. This will be a significant challenge as it will require nations to come together like never before to support those areas of the world where climate change is causing the most damage.

Which brings us on to hard cash. Mobilising finance has been identified as a key goal for COP26 and to deliver on the first two goals outlined above, developed countries must make good on their promise to mobilise at least $100bn in climate finance per year by 2020. The clock is certainly ticking on that target and our industry has a key role to play in ensuring that international financial institutions and governments feel confident that releasing investment will secure net zero outcomes and greater global resilience.

Skill, ingenuity and genius

I'd go so far as to say that no other industry can provide this confidence, as it is only through the combined skill, ingenuity and genius of construction and infrastructure professionals that solutions will be found to the sustainability challenges facing the planet.

Linked to all of this is the UN's call for everyone to work together to deliver results. Make no mistake about it, we can only rise to the challenges of the climate crisis by working together. Covid has shown what people can achieve when they join together with a common aim and with a shared focus on defeating a common enemy. It should be no different now with climate change and the world leaders gathering at COP26 should remember that. The conference should not be the time for petty squabbling over targets or for disagreements on who is coming out on top in the negotiations and discussions. The world and the future of our planet needs to see real action delivered in a spirit of partnership and shared common interest.

As a sector that relies on teamworking and mutual support between its many component parts, the construction and infrastructure industry is in a unique position to demonstrate that embedding a culture of collaboration on climate change is productive for governments, clients, contractors and supply chains. Without it, there is no chance that the world will meet its net zero obligations. It's that simple.

Our industry needs to be able to offer tangible solutions and point the way to achieving better outcomes. Crucially though, we need to be engaging the politicians and business leaders on the key changes, innovations, projects and technologies that need to be pursued as they plan for a zero carbon, circular and resilient future.

So, high stakes in Glasgow in November then. And rightly so. But also, it's a big opportunity for the construction and infrastructure sector to highlight its skill, foresight and pivotal role in making the decisive difference in helping to solve the most urgent and important challenge that has ever faced global society.

Seizing the moment

COP26 provides a key opportunity to seize the moment. From a global perspective, the world really can't afford the UK, as the host of this international gathering, to mess up. COP26 should not be a conference that sees interesting announcements about what might happen in the future, it really is about making decisions and agreements to do stuff right now.

From an industry and business perspective, we need to change once and for all the way that we run and operate our infrastructure to meet the challenge of net zero. COP26 provides that opportunity. We need to grasp it with both hands and show the world that we are up to the challenge.

Sustainable infrastructure can drive post-Covid global recovery

The United Nations Environment Programme (UNEP) is urging planners and policymakers to take a more systematic approach to sustainable infrastructure.

Zimbabwe has long struggled with crippling power outages, some of which can last up to 18 hours a day. The cuts have been especially hard on the country's hospitals and clinics, forcing nurses to deliver babies by candlelight and doctors to postpone emergency surgeries.

But that is starting to change. Since 2017, Zimbabwe has installed solar panels atop more than 400 healthcare facilities, steadying power supplies and replacing expensive and polluting diesel-fired generators. The Solar for Health initiative is a prime example of the type of sustainable infrastructure development that will be vital to combating climate change, improving public services and driving the economic recovery from Covid-19.

So says a new report from the UNEP which urges planners and policymakers to take a more systematic approach to sustainable infrastructure, incorporating it into their long-term development plans and ensuring human-made systems work with natural ones.

Inger Andersen, executive director of UNEP, said: "We can no longer use the business-as-usual approach to infrastructure, which is leading to ecological destruction and massive carbon dioxide emissions. Investments in sustainable infrastructure are not only environmentally sound but also bring economic and social benefits. Low-carbon, nature-positive infrastructure projects can help minimise the sector's environmental footprint and offer a more sustainable, cost-effective path to closing the infrastructure gap."

A source of emissions

Built infrastructure, which includes everything from office blocks to highways to power plants, is responsible for 70% of all greenhouse gas emissions, says the *International Good Practice Principles for Sustainable Infrastructure report.* Poorly designed, infrastructure can also displace communities, endanger wildlife and weigh, often for decades, on public finances.

"There is an urgent need to include sustainable and climate resilient infrastructure as an integral part of green growth to deliver energy, water, and transportation solutions that will facilitate opportunity, connection and sustainable growth," said Ban Ki-moon, former UN secretary-general and the president of the Global Green Growth Institute, a UNEP partner. Ban said that the new report was a "very useful guiding framework for governments to lay the groundwork for a future where sustainable infrastructure is the only kind of infrastructure we know".

To help countries reach that goal, the new UNEP report offers guiding principles for governments to integrate sustainability into their decision-making on infrastructure. Among other things, it recommends that states align their infrastructure planning with the UN sustainable development goals, humanity's blueprint for a better future. It also urges them to minimise the environmental footprint of construction projects and meaningfully engage local communities in infrastructure decision-making.

Return on investment

The report also highlights the economic return on sustainable infrastructure, which includes renewable energy plants, eco-friendly public buildings and low-carbon transport. Investing in renewables and energy efficiency, it said, creates five times more jobs than investments in fossil fuels. Similarly, investing in resilient infrastructure in developing countries can create a return of $4 for every $1 invested, according to the World Bank.

Alongside the report, UNEP has released a series of case studies that showed how many countries are finding innovative ways to develop sustainable infrastructure.

In Ecuador, the government has turned to nature-based solutions to bolster water supplies to several major cities. By replanting trees, fencing off rivers and purchasing land for conservation, one region has revived watersheds that support more than 400,000 people.

In Singapore, which is aiming to have 80% of its buildings certified as green by 2030, builders have used recycled materials to construct everything from schools to corporate offices. The country was also the first to unveil a building constructed entirely of recycled concrete aggregate and demolition waste.

With Covid-19 sparking a global wave of stimulus spending, Ambroise Fayolle, vice president of the European Investment Bank said the publication of the principles "is timely, reminding us all of the importance of building back better by tackling the long-term challenges we face."

This article was provided by the United Nations Environment Programme (UNEP) and originally appeared on the UNEP website. UNEP's mission is to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.

Sizewell C - building on a legacy of success

As well as renewables, energy technologies will be needed to help keep the lights on when the sun doesn't shine and the wind doesn't blow, says *Julia Pyke.*

Julia Pyke
is director of finance and economic regulation at Sizewell C.

As the UK makes the transition to net zero emissions, electricity demand is expected to double and that means we'll need to generate four times the low-carbon electricity that we produce today. Renewables will play the biggest role in meeting that challenge, but we are going to need other technologies to help keep the lights on when the sun doesn't shine and the wind doesn't blow.

Nuclear power generation is the perfect partner to work alongside renewables as it creates a lot of low carbon energy from a small land footprint and is available 24/7. It will help to build a stable net zero energy system for the future and reduce our reliance on imports.

Sizewell C is ready to become the next nuclear project in the UK and, if it gets the go-ahead, will be built on the Suffolk coast next to Sizewell B. It will supply reliable, low carbon electricity to six million homes for 60 years and avoid around nine million tonnes of CO2 each year.

Sizewell will be a near replica of Hinkley Point C, which is five years into construction in Somerset. 22,000 people in the UK are currently working on that project which has also trained more than 750 apprentices. Hinkley Point C is breathing new life into 3,600 supply chain companies across the country and bringing investment on a scale the nuclear sector has not seen in a generation.

These industrial benefits can be repeated at Sizewell C where we expect to train 1,500 apprentices and support 70,000 green jobs. Maintaining and bolstering the nuclear supply chain will also help unlock the technologies of tomorrow, such as hydrogen, direct air capture and small or advanced modular nuclear reactors.

Building a copy at Sizewell means construction costs will be lower. Hinkley Point C is already clearly demonstrating the benefits of replication. There are many examples where manufacturing and installation have been quicker for Unit 2 (the second of two reactors) than Unit 1. These efficiencies can be applied at Sizewell where we also don't have to repeat the process of approving components to meet the UK's regulatory requirements.

As a follow-on project, Sizewell C faces less risk and this opens the possibility of applying a funding arrangement with a lower cost of capital. The government has just introduced legislation to allow the so-called RAB (Regulated Asset Base) model to be used for future nuclear projects. RAB has already been used to finance £180bn of British infrastructure in electricity and gas networks, water, telecoms and transport. Applied to nuclear, the government estimates it will save consumers £30bn for each new large-scale project compared to other funding options.

COP26 takes place in the 65th anniversary year of the opening of Calder Hall, the first nuclear power station in the UK. Since then, nuclear has quietly helped to keep the lights on and has saved more carbon than any other electricity source. Sizewell C can build on that legacy. It will provide value for money to consumers and play a key role in a future, cleaner energy mix.

Towards a greener and fairer future

We're living in a global climate emergency, where we all need to go faster and further than ever before to limit the impacts of climate change on our society, says *Graham Dey MSP.*

Graham Dey
is the minister for transport in the Scottish government.

COP26 must accelerate the world's transition from an unsustainable present to a greener and fairer future. It must secure commitments to emissions reductions that are capable of limiting global warming to 1.5°C and at the very least, it must achieve near term commitments that keep that objective well and truly alive in the longer term.

The Scottish government is taking decisive action that does not shy away from transport's role as the largest emitting sector and ensure that we decarbonise on a broad range of fronts and encourage a shift towards more sustainable public transport options and active travel. We need to transition to zero emission transport system in a way that is just, where everyone can benefit and where no community or sector is left behind.

We're also looking more holistically at planning, placemaking and working practices, as areas which are key drivers for travel demand. Our *Programme for Government* sets out how we'll take Scotland on a green transport revolution.

Central to this is our world-leading commitment to reduce car kilometres travelled nationally by 20% by 2030. In addition to our ambitions around planning and placemaking through the development of 20-minute neighbourhoods, we're supporting this commitment by providing free bus travel for those under the age of 22, decarbonising our rail network, investing over half a billion pounds in bus priority infrastructure and by almost tripling our active travel budget to £320m, representing 10% of what we spend on transport by the end of this parliament.

Later this year, we will publish a route map outlining further measures to achieve this reduction target, assuming the Covid pandemic has moved to a phase to allow this. We're also progressing our second *Strategic Transport Projects Review* that will help to deliver the vision, priorities and outcomes for transport in Scotland set out in our *National Transport Strategy.*

At the same time, to help deliver a green recovery from the pandemic, we're working hard to ensure Scotland is at the forefront of markets for zero emission mobility – and doing so in a way which benefits people and communities whilst we make this transition to a net zero economy.

We're investing £120m to support and attract further innovating financing for the delivery of fully electric and hydrogen buses and we're also working with housing associations and other community groups to fund zero-emission car clubs. We've already invested over £918,000 in this area, providing affordable access to modern zero-emission vehicles whilst reducing the need for personal car ownership.

We know from recent reports that relying on advances in technology alone will not be enough. We need a twin-track approach which encourages a shift away from private car use and towards more sustainable forms of transport. We're making good progress, but there is much more to do, and COP26 is a critical moment to raise global ambition on transport decarbonisation and secure commitments that are capable of responding to the climate emergency by limiting global warming to 1.5°C.

Clock is ticking - and our response must be electric

Given rising demand for electricity, the UK needs to replace everything generating power today and then build the same again, argues *Chris Ball*.

Chris Ball
is managing director for nuclear and power at Atkins.

Grab your smartphone and download the Electricity Map app. It shows you where the UK's power is coming from at any one moment, and carbon emissions relating to those energy sources. It's clear to see that UK electricity generated by nuclear, solar or wind energy is the cleanest, greenest option. Sure, hydrogen has its role too, but producing green hydrogen also requires electricity.

Our best and only route to achieving net zero CO2 emissions by 2050, only 29 years away, is mass electrification. We will need much, much more electricity than we generate today. We will be powering electric transportation, heating our homes, powering industrial processes, and replacing gas and oil, and we must also decarbonise existing sources as we go.

Working on the basis that our grid demand will double from today's levels and that most of our existing electricity infrastructure will have retired by 2050, our challenge is clear. We must replace everything generating our power today and then build the same again. All in a way that meets our net zero goals.

A mixture of energy sources to generate electricity is the ideal situation. Renewables are a great step forward, but the challenge caused by intermittency drives a need for greater levels of energy storage. As renewables' penetration increases, so does the cost of providing this storage. We must therefore look at the system as a whole. The ideal solution rests in a combination of technologies from intermittent renewables to firm nuclear power, all working harmoniously together. Something drastic needs to happen and we need action now.

Between now and 2050 we need to connect around 9GW a year of electricity generation to the grid if we are to meet the net zero challenge. This is about 50% higher than the maximum annual build rate over the last 60 years, and about four times higher than the average build rate. This must come from a variety of low-carbon sources – wind, solar, nuclear, gas with CCS, together with energy storage infrastructure.

Suggesting anything otherwise is not only misguided but also damaging to our net zero ambitions. As recent fears have highlighted, energy security is simply too important for any government to play anything other than an active role.

It's not impossible. We should be excited by the prospect of revolutionising the way we generate and use energy in our country to protect our world for future generations. It does, though, require the oversight, responsibility, governance, and culpability from the world's governments.

What are governments doing today to encourage broader uptake of renewable and zero carbon approaches? Where is the energy system architect who can pull all this activity together? We need to build everything we can and build it as fast as we can. This is what COP26 needs to address and act on – fast. The 2050 deadline is drawing nearer, and the world cannot wait.

Partnerships are key to increasing impact of green investment

The Green Investment Group's *Progress Report 2021* highlights a shift to the creation of specialist development platforms and partnerships for established and emerging technologies.

Macquarie's Green Investment Group (GIG) annual *Progress Report* highlights key transactions and developments from its latest reporting period and GIG's evolving business strategy and includes detailed green impact reporting and provides an introduction to GIG's approach to net zero.

GIG's key highlights from the past year include securing the rights to develop the 1.5 GW Outer Dowsing Offshore Wind Farm in the UK and establishing partnerships to bid for offshore projects in Scotland, France and Norway. The past year also seen the launch of Cero Generation, GIG's specialist European solar development platform, which is one of Europe's largest dedicated solar development companies.

Elsewhere, GIG portfolio company Blueleaf Energy has expanded into Japan, the Philippines and India and a new partnership has been established with Heliox to deliver a pioneering charging-as-a-service solution for fleet electrification. This year also saw GIG acquire its first utility-scale battery storage portfolio in the UK from Capbal.

"To deliver the green energy capacity that's so critical to achieving our global climate ambitions, we urgently need to increase the volume and pace of projects under development," says Mark Dooley, global head of GIG. "That's why this year, GIG's focus has been on the creation and growth of specialist development businesses and partnerships.

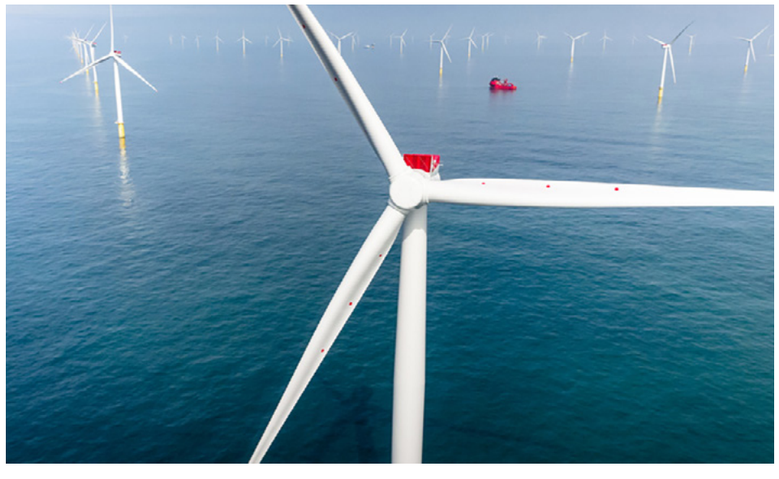
"Instead of focusing on individual assets, our platform and partnership model enables us to amplify the impact of our investments by advancing multiple gigawatt scale portfolios with teams of technical experts, ultimately delivering transformational volume into the market.

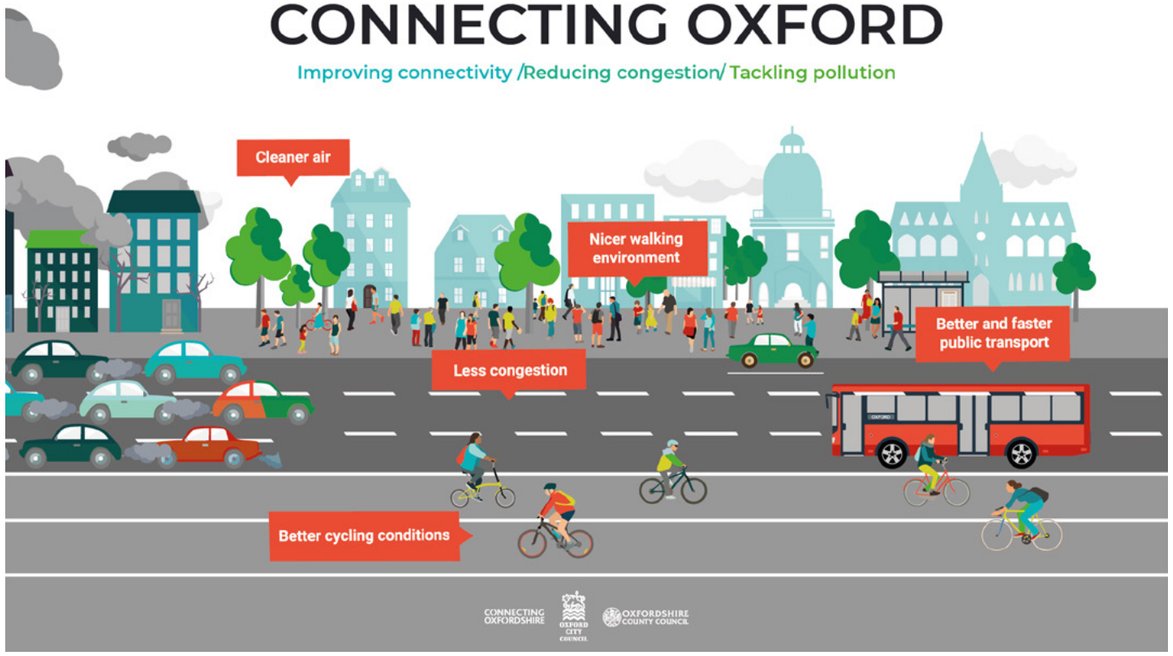
"It's an approach that works for established technologies like solar, as well as newer technologies such as battery storage and it has enabled us to grow our global development pipeline to well over 30 GW."

Looking ahead, Dooley sees 2021 as a crucial staging post in the ongoing global fightback on climate change. "2021 will be a defining year in what will be a decisive decade in the fight against climate change. The world will soon meet at COP26 to conduct the most important global climate negotiations since Paris. Set against a backdrop of the Intergovernmental Panel on Climate Change's latest report, which shows in stark detail the scale and urgency of the challenge in front of us, the call to action is clear – we must raise our ambition."

Dooley also says that adopting a partnership approach is the best way to maximise the impact and reach of green investment. "Though this approach, we increased the GIG portfolio's total capacity to over 30 GW across more than 240 projects – from the established markets of the UK and US, to emerging markets including the Philippines and India," he said. "It's testament to the age-old adage that we can achieve more by working together than we can alone," says Dooley.

Click here to access the full *Green Investment Group Progress Report*.





Rethinking Oxford's transport to become a net zero city

Changing how cities look at their travel options is crucial to tackling the climate emergency, says Oxford City Council's *Tom Bridgman*

As we approach COP26, the eyes of the world will be on the UK and what we are doing to tackle the climate emergency. Here in Oxford, we have a long history of being known for innovation and progress and being home to some of the world's leading experts and scientists in the climate sphere.

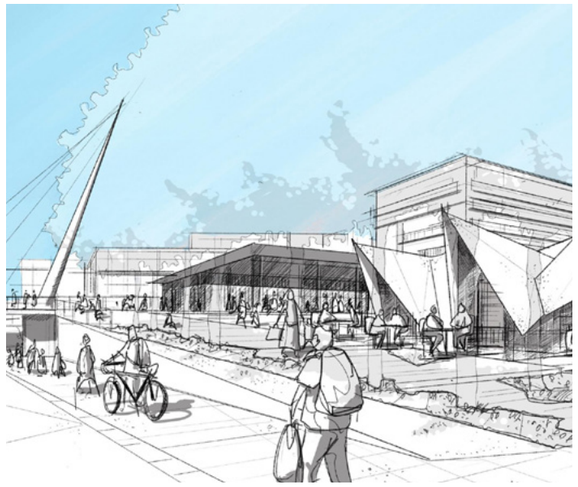
We have an ambition to become a zero carbon city by 2040 and at Oxford City Council we want to become a zero carbon council, in terms of our operations, by 2030. Reaching net zero is not going to be easy and will require significant collaboration between the local authorities, local and national stakeholders and residents. But we know what we need to do and the importance of balancing our net zero ambitions with our wider aspirations to create a vibrant and inclusive economy.

Combining transport connectivity and sustainability is key in helping us to achieve this. Oxford's transport sector is the largest contributor of NOX emissions in the city - accounting for 68% emissions - so it is important that as we grow as a city we consider how this can be done sustainably.

Oxford is a medieval city with 21st century transport problems and is seeing more and more people travelling in every day both for work and leisure. This is ultimately impacting travel times, congestion and pollution across the city, especially during rush hour.

First/last mile connectivity is critical to Oxford's future success and our focus must be on establishing an integrated transport strategy for the city that ultimately sets out a pathway to a zero carbon network.

The redevelopment and expansion of rail capacity at Oxford station, including proposals for two new train lines and platforms, will not only support stronger transport links across the Oxford-Cambridge Arc and the rest of the country, it will also be crucial in supporting our economic recovery, helping us to tackle the climate emergency and promoting sustainable transport and movement into and within the city. Alongside this, reopening the Cowley branch rail line for passengers is a first order priority for



partners and will connect the areas of greatest residential and employment density into the city centre and beyond.

Our Connecting Oxford plans aim to support this further, with proposals for a workplace parking levy, alongside traffic filters at key point across the city's road network to prioritise active, communal and sustainable travel such as walking, bikes and buses, while reducing through traffic and congestion. We desperately need to encourage more people to use alternate transport, not only to help us reach net zero, but also to ensure our city keeps moving.

Bus travel will remain essential to the future success of Oxford and we are working closely with the county council and bus operators to inform a new Bus Service Improvement Plan and legally binding enhanced partnership to drive further innovation across the network.

Over the past few years we have also been developing proposals for Britain's first Zero Emission Zone (ZEZ) and we will be introducing the ZEZ pilot in February 2022.

Much like a congestion zone, the pilot will mean that polluting vehicles will be charged if driven in key city centre streets, with the level of the charge dependent on how polluting the vehicle is. The ZEZ pilot is an important step in tackling air pollution and will help make our city centre a cleaner, healthier and more attractive place to live, work, visit and shop.

Creating attractive cities in another benefit of working towards sustainable policies, as we clearly saw this summer through the success of our Broad Meadow project which saw the creation of a temporary pedestrian-friendly outdoor space in the middle of Oxford city centre, containing wildflowers, trees and small lawns. We have received lots of useful feedback so far on the scheme and it just goes to show what is possible when you think outside of the box.

Changing how we look at travel options in to and out of our cities is key as we look to tacking the climate emergency and as we look to creating cities of the future.

Tom Bridgman
is executive director – development at Oxford City Council.

Action not words needed on climate change

The UK government has set out its stall ahead of COP26 with a new net zero strategy, but will it deliver what's needed and, crucially, how? *Rob O'Connor* reports.

The National Infrastructure Commission and the Climate Change Committee both cautiously welcomed the UK government's new net zero strategy, Build Back Greener, but both have urged that now is the time for urgent action to replace warm words.

A strategy that claims to set out how the UK will secure 440,000 well-paid jobs and unlock £90bn of investment by 2030 on its path to ending its contribution to climate change by 2050, is certainly ambitious in its scope but there are still many questions over the lack of clarity in how some of the projected outcomes can be achieved and also some concerns over a potential lack of commitment on decarbonising rail.

Building on the prime minister's ten-point-plan, unveiled almost a year ago, ministers say that the UK net zero strategy sets out a comprehensive economy-wide plan for how British businesses and consumers will be supported in making the transition to clean energy and green technology – lowering Britain's reliance on fossil fuels by investing in sustainable clean energy in the UK, reducing the risk of high and volatile prices in the future, and strengthening the UK's energy security.

"The strategy is hugely ambitious and has to be delivered. The priority now is to get on with it."

Sir John Armitt, chairman of the National Infrastructure Commission.

Ministers also say the strategy will provide certainty to businesses to support the UK in gaining a competitive edge in the latest low carbon technologies – from heat pumps to electric vehicles – and in developing thriving green industries in the UK's industrial heartlands – from carbon capture to hydrogen, backed by new funding.

As part of the strategy, new investment includes:

- An extra £350m of the government's £1bn commitment to support the electrification of UK vehicles and their supply chains and another £620m for targeted electric vehicle grants and infrastructure, particularly local on-street residential charge points.
- An ambition to enable the delivery of 10% sustainable aviation fuel by 2030, with £180m in funding to support the development of UK SAF plants.
- £140m industrial and hydrogen revenue support scheme to accelerate industrial carbon capture and hydrogen, bridging the gap between industrial energy costs from gas and hydrogen and helping green hydrogen projects get off the ground.
- Two new carbon capture clusters - Hynet Cluster in north west England and North Wales and the East Coast Cluster in Teesside and the Humber - backed by the government's £1bn support.
- An extra £500m towards innovation projects to develop the green technologies of the future, bringing the total funding for net zero research and innovation to at least £1.5bn.
- £3.9bn of new funding for decarbonising heat and buildings, including the new £450m three-year boiler upgrade scheme, so homes and buildings are warmer, cheaper to heat and cleaner to run.
- £124m boost to the Nature for Climate Fund helping meet government commitments to restore approximately 280,000 hectares of peat in England by 2050 and treble woodland creation in England to meet commitments to create at least 30,000 hectares of woodland per year across the UK by the end of this parliament.
- £120m towards the development of nuclear projects through the Future Nuclear Enabling Fund. Ministers say this could support the path to decarbonising the UK's electricity system 15 years earlier from 2050 to 2035.

Prime minister Boris Johnson said: "The UK's path to ending our contribution to climate change will be paved with well-paid jobs, billions in investment and thriving green industries – powering our green industrial revolution across the country. By moving first and taking bold action, we will build a defining competitive edge in electric vehicles, offshore wind, carbon capture technology and more, whilst supporting people and businesses along the way. Our strategy sets the example for other countries to build back greener too as we lead the charge towards global net zero."

National Infrastructure Commission chairman, Sir John Armitt, said: "The strategy sets out a range of commitments and timescales for action. It is both hugely ambitious and has to be delivered. The priority now is to get on with it.

"It is encouraging to see a commitment to developing a whole new industry to remove greenhouse gases from the atmosphere, which the commission has recommended needs to be put in place over the next decade if we are to meet our international climate obligations. The strategy indicates broad agreement with the commission's proposals for how this market should be regulated and financed and we look forward to seeing further details in due course."

Climate Change Committee chief executive, Chris Stark, said: "We didn't have a plan before, now we do. This is a substantial step forward that lays out clearly the government's ambitions to cut emissions across the economy over the coming 15 years and beyond. It provides much more clarity about what lies ahead for businesses and individuals and the key actions required in the coming decades to deliver a net zero nation. It also gives the UK a strong basis to be president of the forthcoming COP26 summit. The critical next step is turning words into deeds."

Nuclear financing - what do we need now?

Nuclear investment is green investment and a critical part of a net zero future and the government needs to commit to it with confidence, says *Lincoln Hill* of the Nuclear Industry Association.

Lincoln Hill
is the director of policy and external affairs at the Nuclear Industry Association.

It comes down to money in the end. As the chairman of the Nuclear Industry Association (NIA) Tim Stone has said before, nuclear financing should not be harder than nuclear physics. If we can split an atom and harness its energy, as even Einstein thought we could not do, we can find a way to pay for some new power stations.

There are two questions that we need to answer to resolve the financing conundrum. Is there a way to reduce investor risk so the private sector will finance nuclear projects at reasonable rates? And, in an era of net zero and ESG (environment-social-governance), is nuclear a green, clean and sustainable investment?

The answer to both questions is yes, but perhaps more importantly, the time to implement those answers is now. On the first, we know that the regulated asset base (RAB) model is a known quantity for investors of all types. The RAB gives investors the security of a revenue stream during construction and the security of sharing risk between themselves and the UK government. The reassurance that it is committed to nuclear is a valuable commodity to investors, taking away the debilitating unknown of political risk.

Thus, if the government sets out these parameters for a RAB model in law, we should be able to cut the cost of capital for new projects substantially. Cutting capital costs should cut overall costs at least 30%, at which point nuclear becomes a very competitive proposition in a net zero world. All that remains on this question is to get the legislation to put the RAB into effect.

There is, however, a complicating factor. In a marketplace that is moving to a 100% ESG position, investors also need reassurance that nuclear investment is green investment. The government's Green Financing Framework, unintentionally, sent the opposite signal by excluding nuclear. It has reassured us that "the framework does not stipulate what the government considers to be green and what is not – this is the role of the UK taxonomy." That taxonomy is in the hands of the Green Technical Advisory Group (GTAG) who are charged with evaluating, amongst other things, the science-based case for nuclear as a green investment activity.

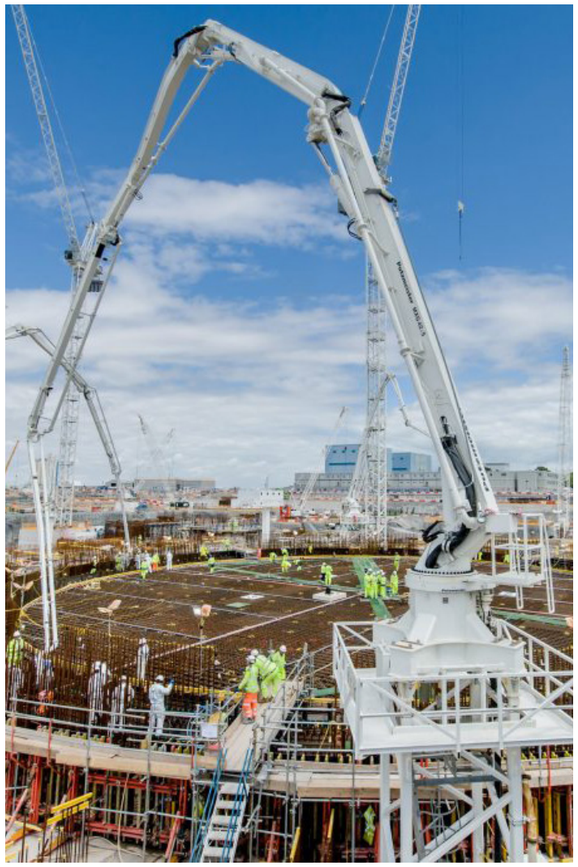
On the science alone, our case is ironclad and rests on three pillars. The first is that according to the UN Inter-Government Panel on Climate Change, nuclear has, alongside wind, the lowest lifecycle carbon intensity of any electricity source. As we seek to avert climate catastrophe, that is the single most important factor to consider. The second is that nuclear has the smallest land footprint of any clean energy source - the whole UK nuclear fleet generates 16% of electricity from less than one square mile.

This efficiency minimises our collateral environmental impact, another key consideration. The third is our exemplary record of waste management. The UK civil nuclear sector has managed its own legacy and taken on that of the weapons programme, with unequalled professionalism and dedication. The public has never been at risk from waste and we will keep it that way. In pursuing geological disposal, we are following global best practice, and in building new reactors, we are only creating a tiny amount of waste for a tremendous amount of clean energy. Indeed, the EU's JRC has thoroughly examined all these issues and concluded that there is no science-based case for treating nuclear different than renewable technologies.

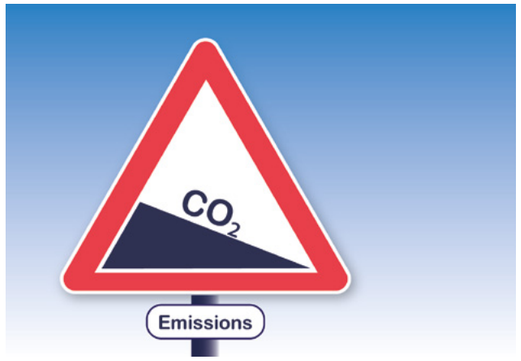
What we need then is for the GTAG to give its preliminary advice to the government that nuclear investment is green investment. In combination with legislation for the RAB model, this would show investors that nuclear is a critical part of our net zero future to which they can commit with confidence.

Time is the key issue now. Time is usually a great validator of nuclear power, with many projects lasting well beyond the lifetimes of those who conceived and designed them, but it is not on our side here. The first AGR station, Dungeness B, has already retired. Within ten months, two more generating stations, Hunterston B and Hinkley Point B, will go.

Without new investment mobilised by new financing solutions, our world-class nuclear skills base is at risk. Without that skills base to deliver new projects, our vision of a net zero economy will slip beyond reach. The solution, however, is two simple steps - a bill and a statement - and for the sake our planet and for coming generations, we can afford both.



COP success can inspire net zero progress at home



A successful COP26 conference should inspire the government to tackle the more complicated issues so the UK can make progress on its net zero commitments, says *Matthew Farrow.*

Matthew Farrow is director of policy at the Association for Consultancy and Engineering and the Environmental Industries Commission.

More than 30,000 people are expected at COP26 in Glasgow as the world gathers to discuss climate change. Among these them will be hundreds of diplomats – the largest gathering of them on these shores since World War Two – as the conference gears up for two weeks of intense climate discussion and negotiation.

The international politics of the conference will revolve around two key aspects of perceived 'fairness'.

First, how to split the emission cuts needed to ensure climate warming remains within a manageable 1.5 degrees between different countries, with particular debate over the expectations on rapidly growing nations such as India, China and Brazil to do more.

China has said it will aim to 'peak' its emission by 2030 and recently claimed it would stop building and financing coal fired power stations overseas. However, the Chinese government is determined not to make any climate commitments which risk causing unrest among its own people. For example, in response to recent power shortages, the government has ordered its coal power stations to maximise output and has been buying up natural gas supplies.

Second, many of the poorest countries in the world are facing the worst impacts of the changing climate while not being major emitters themselves. They expect richer nations to transfer massive funds to them to help compensate for this. President Biden recently doubled US spending on 'climate aid' but expect major rows around this in Glasgow.

Whatever the final outcome of the conference, UK prime minister Boris Johnson will, of course, present it as a success and use it to demonstrate our green credentials internationally, reinforce our leading role in sustainable technology and to its fullest at home where it will boost his own standing on environmental issues.

However, there is currently a gap between the political rhetoric and reality on net zero in the UK. The truth is we're currently not on track to meet our target. Let's hope that a successful COP26 can inspire the government to begin to tackle the more complicated issues so that we can make progress on meeting our commitments.

The construction and built environment, of course, has a key role to play in all of this. The Construction Leadership Council will be present at COP26 and represents the wider industry on Built Environment Day. I have no doubt that alongside the usual discussions on advances in building materials and a digital-first approach to design, we will also see conversation turn to the detail which is absolutely necessary if we are to make any real and tangible progress.

It will only be through constructive engagement with our industry that this can happen. If the political will is there for progress on international climate targets at COP26, there is no reason why it shouldn't be there for tangible progress at home too.

Carbon capture vital to tackle the climate crisis

We need to double down on efforts to bring forward the technologies which will support the global effort to decarbonise, says Drax Group's *Jason Shipstone.*

The stark warnings delivered by the world's leading climate scientists this summer made it clear that we're 'on code red' – not enough is being done to prevent a climate catastrophe. According to the UN IPCC, there is an increasing likelihood that the average temperature will temporarily exceed 1.5°C above the pre-industrial era temperature in the next five years, which the Paris Agreement seeks to avoid.

But we can't allow ourselves to become defeated or disheartened – instead we need to use our energies to double down on our efforts to go further and do more to bring forward the technologies which will support the global effort to decarbonise.

The UK government has set very ambitious targets to reduce emissions, with plans to cut greenhouse emissions by 78% by 2035 compared to 1990 levels. However, the climate crisis is now so serious that it's not enough to reduce emissions – we also need to permanently remove carbon dioxide from the atmosphere.

It's widely recognised by leading climate scientists at both the Climate Change Committee and the UN IPCC that carbon capture and storage technologies that deliver negative emissions are vital to global efforts to combat the climate crisis. This is because they don't just reduce emissions, they can permanently remove CO2 from the atmosphere.

A recent report by the newly formed Coalition for Negative Emissions, of which Drax is a founding member, found that more than 1 gigatonne of negative emissions per year would be needed by 2025 to avoid irreversible climate damage. To put that into perspective, it's equivalent to removing more than twice the UK's annual CO2 emissions each year for the next four years, which we're nowhere near achieving now.

One solution is bioenergy with carbon capture and storage (BECCS), which Drax is pioneering at our power station in North Yorkshire. Once operational, it will capture millions on tonnes of CO2 every year, permanently locking it away deep under the North Seabed, whilst also generating renewable electricity for millions of homes across the UK.

Jason Shipstone is the chief innovation officer at Drax Group.

But BECCS is not the only solution. Other solutions such as Direct Air Capture and Storage and natural climate solutions (such as afforestation), will also play a vital role in the decarbonisation puzzle. Whilst there is no silver bullet or single technology that will fix the climate crisis, we need to work together to develop the right frameworks to enable these solutions to be deployed and fast.

Negative emissions technologies like BECCS are available now and have the potential to be a cornerstone of the global green economy. The National Infrastructure Commission recently said that negative emissions technologies could kickstart a whole new industrial revolution in the UK, creating and protecting thousands of jobs and putting the country at the forefront of groundbreaking, environmentally friendly technologies.

As the world looks to COP 26, the UK has an opportunity to show global leadership in support of these new green technologies and also to demonstrate what can be achieved when businesses, communities and governments come together to make this a decade of delivery.

A clear commitment to reach net zero

The UK Green Building Council (UKGBC) has welcomed the government's net zero strategy as a clear commitment to reach net zero, says its chief executive, *Julie Hirigoyen.*

The UKGBC welcomes the publication of the government's comprehensive net zero strategy and the final report of the Treasury's net zero review. Together, they represent a clear commitment by the government to reaching net zero, securing a just transition and unlocking the wider economic benefits.

The net zero strategy clearly acknowledges the scale of the challenge ahead and the significant emissions reductions required from our sector in particular. As distinct from the recently launched heat and buildings strategy, we welcome the inclusion of further information on plans to support action intended to improve reporting on embodied carbon in buildings and infrastructure, with a view to exploring a maximum level for new builds in the future.

Embodied carbon emissions can make up more than half of the emissions of a building over its entire lifecycle and our sector clearly has an important role to play in relation to design choices. We believe the industry is ready to take meaningful action and are therefore calling for a commitment to introduce the regulation on embodied carbon at the building level at the earliest opportunity, starting with mandatory measurement of whole life carbon on large projects, to be followed by the phased introduction of embodied carbon limits for new buildings.

The planning and design of the built environment also has a significant impact on other sectors, such as transport and we are therefore pleased to see increased investment in electric vehicle infrastructure and the use of nature-based solutions for carbon mitigation. We hope the government does not miss the opportunity to promote a holistic approach to decarbonisation, resilience and nature restoration through its upcoming planning reforms in England.

Julie Hirigoyen is chief executive of the UK Green Building Council.

Lastly, UKGBC welcomes the conclusion of the Treasury's net zero review that a successful, orderly transition for the economy will deliver significant benefits – including lower household costs and wider health co-benefits. If these are to be realised, then the government must work to fill in the blanks in its plans, including support for a large scale domestic retrofit programme and building the associated supply chain, introducing an array of fiscal incentives to support homeowners and a strong regulatory framework to provide clarity around the trajectory and pace of change required.

As part of UKGBC's Net Zero Whole Life Carbon Roadmap, we have conducted a major industry-led multi-stakeholder study into the government policies and industry actions required for the UK to achieve net zero carbon in the construction, operation and demolition of buildings and infrastructure. The report includes specific recommendations related to embodied carbon. *Click here to view UKGBC's detailed recommendations for policymakers.*

UKGBC's Net Zero Whole Life Carbon Roadmap will be published at COP26 on 11 November 2021 during Cities, Regions and Built Environment Day.

Global action needed on buildings and infrastructure

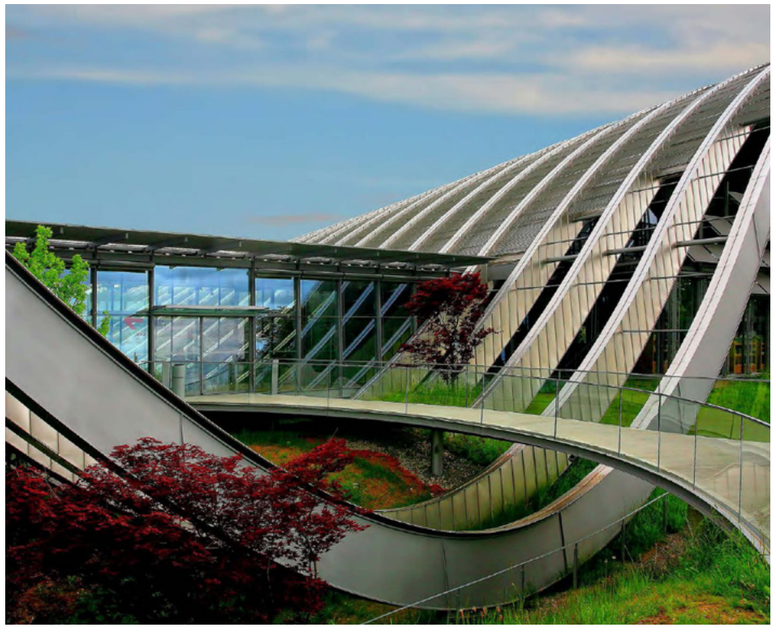
The World Green Building Council (WorldGBC) is identifying opportunities for how an integrated approach to the whole built environment is essential to deliver change commensurate with the commitments of the Paris Agreement.

The World Green Building Council report, *Beyond Buildings: Why an integrated approach to buildings and infrastructure is essential for climate action and sustainability*, argues for systemic and integrated infrastructure solutions to improve sustainability outcomes.

Business leaders recognise that the built environment – buildings and infrastructure – must be on a clear path to decarbonise at the latest by 2050 and have made significant progress by 2030 and the WorldGBC network is calling on the built environment industries for collaboration and alignment in ambition for all asset types, in all places to accelerate the transition of the infrastructure sector. The urban built environment alone is responsible for 75% of annual global GHG emissions, with buildings accounting on its own for 37%.

The council's new report is a call to action for the built environment industry and policy makers to respond to the climate crisis by acting together. In Beyond Buildings, the WorldGBC highlights the interconnection between buildings and infrastructure and argues that systemic and integrated solutions will unlock improved sustainability outcomes. They will also accelerate the change in trajectory of GHG emissions from the built environment.

Through presenting the roles that both the private and public sectors must play in terms of investment, policy and procurement, WorldGBC identifies that a global framework of principles is necessary to accelerate sustainability performance across infrastructure. To succeed in this critical decade, united action across all sub-sectors of the built environment industry is essential as the purpose of much of built infrastructure is to create and support places for people.



WorldGBC's report calls for collaboration amongst all actors in the development of a framework of principles. These principles should be adapted and verified at a local level in order to align with the 1.5° emissions trajectory and the UN sustainable development goals and be applicable to all asset types, to be co-created, agreed, and universally pursued.

Cristina Gamboa, CEO of the World Green Building Council, said: "In the lead up to the Cities, Regions and Built Environment Day at COP26, the importance of considering all aspects of the built environment - both the buildings we live in, and the infrastructure that supports them - is critical for taking a holistic and systemic approach to climate action and sustainable development.

"If we're to build a better, brighter future, the infrastructure sector needs to de-link its growth from emissions by embracing a systemic approach which delivers sustainable built environments for everyone, everywhere. The *Beyond Buildings* report sets out a path forward to support the rapid adoption of best practice sustainability outcomes across the building, construction and infrastructure space and identifies critical next steps for the deep transformation needed to meet 2030 reduction goals."

Delivering hydrogen traction on Scotland's railways

Arcola Energy is leading a supply chain consortium to deliver the deployment of hydrogen trains on Scotland's rail network. *Ben Todd* reports.

Decarbonisation and sustainable development are the cornerstones of Transport Scotland's action plan, which establishes the Scottish government's ambition to phase out diesel trains from its network and deliver zero-emission passenger railways by 2035.

Large sections of the Scottish network have already been electrified as part of a rolling programme, but for several remote routes where electrification is not economically viable, hydrogen and battery technology offer complementary sources of traction.

To demonstrate how hydrogen traction can be safely and effectively used on the Scottish network, hydrogen fuel cell integrator Arcola Energy leads a rail supply chain consortium to deliver a production-ready and safety-certified power system for full industrialisation and deployment of hydrogen trains. This includes rail integration of the technology and standards compliance, local supply chain development and recommendations for network deployment of hydrogen trains.

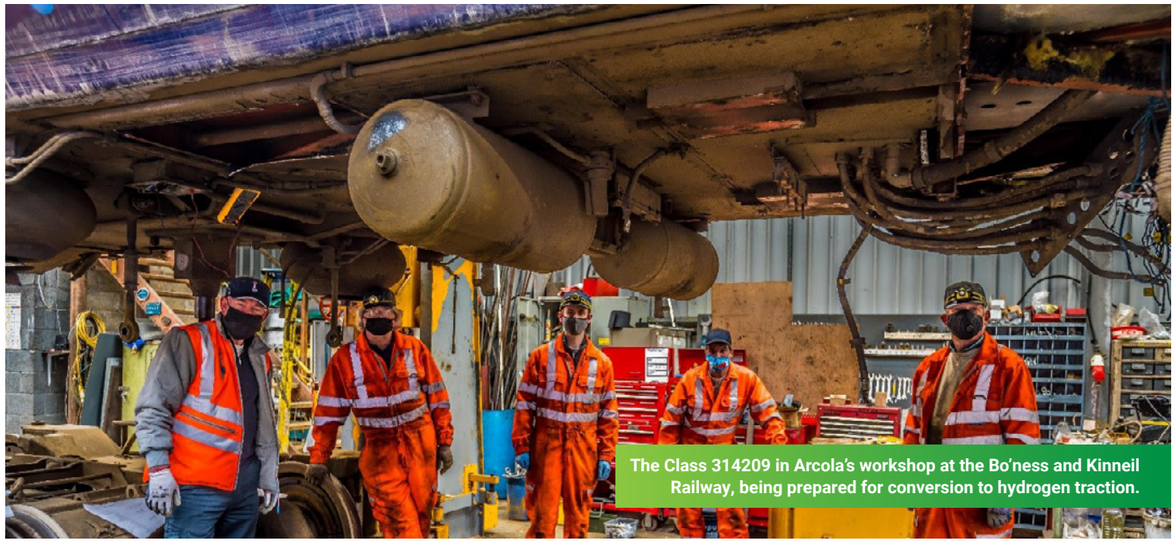
Dr Ben Todd
is the CEO at Arcola Energy.

The project converts a retired class 314 electrical multiple unit (EMU) to hydrogen traction using Arcola's proven A-Drive fuel cell powertrain – mounting hydrogen tanks and battery modules under each end-coach.

The conversion also illustrates the potential of repowering existing rolling stock to deliver a sustainable zero-emission solution to decarbonise Scotland's geographically diverse network, connecting communities and contributing to a green economic recovery. This option enables network operators to ensure efficient use of existing diesel multiple units, providing greater industry confidence in their conformity with existing rail infrastructure.

"It is becoming increasingly clear that hydrogen will play a major role globally in the transition to net zero and Scotland's assets, natural, human and physical, mean that we can be a major player in this emerging global hydrogen market," says Michael Matheson, cabinet secretary for transport, infrastructure and connectivity in the Scottish government.

Scottish government transport and infrastructure secretary Michael Matheson (right) with Arcola Energy's Ben Todd.



The Class 314209 in Arcola's workshop at the Bo'ness and Kinneil Railway, being prepared for conversion to hydrogen traction.

Rail integration of hydrogen traction technology

Proven in several heavy-duty transport applications, Arcola's A-Drive powertrain platform will be extended to meet rail safety and compliance requirements, significantly reducing development time and cost to deliver a complete hydrogen traction solution within a year.

Harnessing the strengths of a hybrid battery-hydrogen system, the electrical energy store comes from the hydrogen and fuel cell combination which increases overall energy density. Meanwhile, power delivery comes from a battery managing the peak power demands. In short, the battery helps to maximise the efficiency of the hydrogen system, and hydrogen is used to reduce the size of the battery

The hydrogen train addresses the cost and practical concerns of electrifying rural routes by carrying its energy onboard, providing power through the reaction between hydrogen (in onboard tanks) and oxygen (in the ambient air). The only by-product of this reaction is water vapour, resulting in a clean, zero-emission alternative to the diesel trains currently in operation.

Depending on the route characteristics, long-distance journeys can be completed without refuelling. Where refuelling is necessary, the green hydrogen production sites emerging across Scotland can provide a supply network to support reliable services and with faster refuelling times than diesel.

Hydrogen traction is also considered an option for so-called 'transitional routes', which have been marked for electrification by 2035. Rather than continuing to operate diesel trains during the transition, hydrogen can decarbonise routes in a shorter timeframe – and help meet the 2035 target – whilst the electronification infrastructure is prepared.

Network deployment and route selection

Hydrogen offers a solution for routes that have been identified by Transport Scotland as requiring 'alternative traction', meaning that whilst they need to be decarbonised, electrification is not feasible. These are typically slower, long-distance and rural routes.

Crucially, the route to deployment of hydrogen trains goes hand-in-hand with Scotland's electrification strategy. To understand the synergies between the two traction options, the hydrogen train project incorporates an assessment of the lines that offers the best potential for a hydrogen service based on a range of factors including service patterns, topography, line speed and their proximity to hydrogen production and fuelling locations.

New skills, new opportunities

The deployment of hydrogen fuel cells opens up opportunities to build a new zero-emission transport sector and create local jobs to support a clean, future railway. Arcola's A-Drive technology platform is an integration of several components and subsystems, many of which are relevant to a wide range of uses in electrified heavy-duty transport.

The hydrogen train project incorporates a dedicated workstream to identify these opportunities for local businesses, primarily in Scotland but also with an eye to the rest of the UK. As the emerging hydrogen economy continues to expand nationally and internationally, Scotland's easy access to natural resources has the potential to offer a particular opportunity to nations looking for a green recovery.

Supporting investment in nature-positive projects

The new New Nature Finance Impact Hub launched ahead of COP26 aims to help build market confidence in nature-positive projects.

There is increasing innovation in relation to nature-positive projects, however there is still much to do to deliver for biodiversity and communities, restore the land and tackle climate change.

In its latest State of Finance for Nature Report the UN Environment Programme estimated that investments in nature-based solutions need to triple by 2030 and to increase four-fold by 2050. This will largely need to come from a significant increase in private sector investment and the recently launched Nature Finance Impact Hub aims to help build market confidence in nature-positive projects by pinpointing their financial and environmental benefits.

The new hub is showcasing comparable data to help those running and evaluating projects as well as to support the design of future projects. The aim is to accelerate the range of projects coming through so that green finance markets can begin to work at a larger scale.

With new goals for restoring nature and kerbing climate change being high on the agenda at COP26, significant private capital will need to be invested in nature-based climate solutions alongside public and charitable funding. However, the lack of comparable data about the performance of nature-positive projects remains a barrier to attracting investment and getting new projects off the ground.

The new Nature Finance Impact Hub aims to address this by providing instant access to data and benchmarks from existing projects, using comparable financial and environmental metrics. It has been developed by sustainability scaleup, Accelar Limited, in collaboration with the UK green finance community.

Accelar's co-founder Chris Fry explains: "The Impact Hub quantifies how innovative, nature-positive projects can deliver return on investment alongside significant benefits for biodiversity, decarbonisation, water management and eco-tourism. It is still relatively early days, but with fast growing interest in this area we look forward to working with the financial and environmental communities so that insightful data can be shared. We hope that this will contribute to a snowball effect, encouraging investment in nature to expand rapidly in the future.".

For the initial launch, the hub already contains data on projects from nine countries covering 11 different kinds of societal benefits from nature, which are known as ecosystem services. Over 40% of the projects address either biodiversity or carbon as an ecosystem service. The diversity built into the hub also enables many other ways of generating revenue and benefiting nature to be highlighted.

Two recent reports have revealed the investment gap to secure key nature-related outcomes in the UK and globally. *The Finance Gap for UK Nature report (October 2021)* commissioned by the Green Finance Institute estimates that between £44bn and £97bn private investment will be required in addition to public sector funding over the next ten years for the UK to meet its net zero and nature-positive ambitions.

The State of Finance for Nature report (May 2021) from the United Nations Environment Programme sets out that if the world is to meet the climate change, biodiversity and land degradation targets, it needs to close a $4.1 trillion financing gap in nature by 2050.

Click here to visit the Nature Finance Impact Hub.

ITER – global collaboration in action

ITER, currently under construction in the south of France, is being developed to prove the feasibility of fusion as a large-scale and carbon-free source of energy.

ITER ("the way" in Latin) is one of the most ambitious energy projects the world has ever seen. In Saint Paul-lez-Durance in southern France, 35 nations are collaborating to build the world's largest tokamak, a magnetic fusion device that has been designed to prove the feasibility of fusion as a large-scale and carbon-free source of energy based on the same principle that powers the sun and stars.

The experimental campaign that will be carried out at ITER is crucial to advancing fusion science and preparing the way for the fusion power plants of tomorrow.

Last year, Atkins was handed a five-year extension for its role as architect engineering for ITER. The role is responsible for the design and construction oversight of all the buildings, services and infrastructure of the site, which is under construction in the south of France. Atkins is part of the Engage consortium, consisting of French groups Assystem and Egis as well as Spanish group Empresarios Agrupados, which will continue working on the project until 2025.

The companies will work on the design, construction oversight, coordination and integration for all 39 buildings, services, as well as the site-wide infrastructure. "As part of the Engage consortium, Atkins has been working for the last ten years on ITER," said Christophe Junillon, market director for nuclear new build at Atkins. "The five-year extension and contract renewal is a testament to the hard work and the collaborative effort of the teams involved in this genuinely ground-breaking project and we're thrilled to continue our significant involvement."

ITER is the world's largest fusion energy experiment, bringing together 35 countries working in partnership aiming to explore its potential as a safe, limitless and environmentally responsible energy source. Not only will ITER be the first fusion device to produce net energy, it will also be the first fusion device to maintain fusion for long periods of time. And ITER will be the first fusion device to test the integrated technologies, materials, and physics regimes necessary for the commercial production of fusion-based electricity.

ITER is the essential bridge between today's smaller-scale experimental fusion devices and the demonstration fusion power plants of the future. It is a scientific experiment that will open the way to industrial and commercial production of fusion energy which would be a global game-changer and Atkins is a key contributor to what is one of the most ambitious carbon-free, sustainable energy projects in the world.

With experiments scheduled to begin in 2025, the world won't have long to wait to test the feasibility of fusion as a large-scale, carbon-free source of energy.

Integrating nature across Edinburgh

Many forward-thinking organisations are now actively advocating the use of nature-based solutions to support sustainable adaptation and development. *Rob O'Connor* reports on a recent initiative by Edinburgh City Council and Atkins.

Edinburgh City Council is currently setting a great example for others to follow on pursuing nature-based solutions in the fight against climate change. They recognise that we are all dependent on a connected network of places where trees, soil, water and thriving, healthy ecosystems support health, wellbeing and the development of a future as a thriving and climate resilient city.

It was in that progressive spirit that Atkins was commissioned to develop a holistic Green-Blue Network for the City of Edinburgh, considering sustainable water management and climate change adaptation at a strategic level to underpin future change and development as part of the Council's Cityplan 2030 and City Vision 2050. This innovative project has been co-funded by City of Edinburgh Council, SUSTRANS, Scottish Water and SEPA.

The six main objectives of Edinburgh's Green-Blue Network are:

Sustainability: Develop a long-term and sustainable approach to river, coastal and storm water management across the city and its environs, addressing water quality, flooding and changes in rainfall risks using nature-based solutions.

Connectivity: Support and promote walking, cycling and sustainable travel to meet local needs, for recreation and to reduce car dependency.

Biodiversity: Increase and protect biodiversity within the Edinburgh Council area by creating and protecting habitat networks, increasing urban tree cover and maintaining and developing open greenspace.

Wellbeing: Promote health and wellbeing with increased opportunities for enjoyment of nature, outdoor education and food production, recreation and play, while improving air quality and moderating temperature.

Beauty: Protect and enhance the cultural heritage and attractive qualities of the city by creating beautiful, accessible places where residents and visitors to enjoy its open spaces, landscape and architecture.

Prosperity: Support economic investment in a sustainable future and carbon reduction aspirations by providing green-blue infrastructure within the city to reduce urban overheating, provide sustainable surface water management and create attractive environments to work and live.

It's no small task, but the Green Blue Network brings the targets within reach by developing an integrated platform combining information from Edinburgh Council, Scottish Water and SEPA along with key stakeholders on environmental green-blue assets.

In meeting its six main objectives, Edinburgh's Green-Blue Network has a number of key aims. It aims to provide a framework to identify opportunities to integrate nature-based solutions in the city at a strategic and local scale and bring together information from Edinburgh council and key stakeholders on environmental green-blue assets, climate risks, active travel and social data to enable partnership working between agencies.

The initiative is also looking to identify strategic green blue corridors and opportunities that can provide environmental, social and economic benefit for people and wildlife. It also aims to sustainably manage water and flood risk and enable the future proofing of the city against the effects of climate change.

As part of an ongoing study, a broad range of Atkins specialists have already worked together to deliver a strategic flood risk assessment and flood risk modelling to identify hotspots for fluvial and pluvial flooding, detailed assessment of all development areas and identification of opportunities to de-culvert 'lost' watercourses.

An integrated digital platform has been created using GIS to bring together data and information as a baseline for the Green-Blue Network and a resource to assist planners and decision makers. Surface water flow paths across the city have also been mapped to identify opportunities for storm water separation using sustainable surface water management to relieve pressure on Edinburgh's drainage infrastructure.

The project has also undertaken natural capital ecosystem services mapping of air quality, noise, recreation, biodiversity and land capacity for carbon sequestration, to identify gaps and opportunities for improvements. Further mapping and analysis have been carried out to identify key opportunity sites at strategic and local scale with potential to provide multiple benefits in the form of ecosystem service improvements, sustainable water management and improved connectivity for people and nature.

Partnership working and extensive stakeholder engagement throughout the course of the project has enabled an understanding of priorities, informed the development of the network and will agree emerging opportunities. This has led to the identification of priority action sites that have significant potential to contribute to the future proofing of the city against climate change.

Further work will provide cost estimates to inform prioritisation and programming of 'priority action' sites to be taken forward for implementation.

As you can see from the above, Green-Blue Network aims to provide an integrated digital framework bringing together information from multiple sources on environmental green-blue assets, climate risks, active travel and social data, identifying future opportunities to integrate nature-based solutions throughout the city.

This will set a benchmark for future development, using the Green-Blue Network in the planning system will provide context and robust information to inform council decisions, enabling opportunities for nature-based solutions to provide positive environmental, social and economic outcomes that will have huge benefits for the city, safeguarding and enhancing its social and environmental heritage for years to come.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