360° view

Turner & Townsend

Game changers

A series of perspectives on the events and trends affecting our industry, communities and planet

Global thought leadership
Issue 14

making the **difference**

Foreword

When change is the name of the game

From geopolitics to technological innovation to climate change and macroeconomics, we are going through a period of global turbulence and disruption. In the face of multiple challenges, policymakers and businesses across all sectors of industry are assessing risks, adapting and evolving fresh strategies for the future.

As the construction industry looks to navigate this uncertainty, its focus is on the factors that will drive the global economy of the future. Already, there are examples of businesses, projects and programmes that are deploying innovative processes and technologies to enable a more sustainable and resilient world.

Collaborate to transform

As events have challenged many long-established business norms, they have accelerated the pace of change and added impetus to environmental, social and governance (ESG) priorities. Supply chains already disrupted by pandemic and geopolitical realities are being reshaped and partnerships strengthened to drive value and sustainable benefits.

More collaborative working relationships are laying the foundations for the delivery of transformational projects and programmes. From New Zealand to the Netherlands, major projects are shaping the infrastructure and buildings of the future, while interventions like the Canadian government's modernisation programme for Ottawa's federal buildings and the district energy system serving them are demonstrating retrofit's potential.

In these and other projects, construction activity is delivering across the ESG agenda, with social benefits including increased engagement and inclusivity. For financial institution Absa Group, a major capital investment plan for its retail and commercial property across Africa is helping to support SMEs and foster team talent, with the help of its joint project management office. For the Kingdom of Saudi Arabia, ambitious plans for hospitality development will help develop skills, employment and manufacturing capability, as well as diversifying its economy.

Innovate to thrive

Cleaner, greener energy sources, such as hydrogen and nuclear, are central to progress towards net zero and future energy security. Successful deployment of these and other energy-generating technologies is being enhanced by working in partnership, which is helping to mitigate risks and assure delivery over the long term.

Alongside energy technologies, a host of new technologies and smart approaches are changing what and how projects are delivered, and our young leaders look to present and future innovation. The application of science, digitalisation, data and collaboration is enabling construction to adapt to today's challenges and thrive, as the game changers featured here illustrate. The people and organisations in the vanguard of change are a beacon for the broader industry.

We hope that you enjoy this latest issue of **360˚view**.

James Dand
Chief Operating Officer,
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Catriona collaborates with our clients to address the key challenges encountered in embedding sustainability in the procurement of major projects and programme's leveraging her engineering and contracts background and passion for sustainability.

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As director of clean energies, David works to identify and target growth opportunities in the renewables and clean energy sector targeting opportunities that combine our programme management and commercial strengths with the technical capabilities of partner organisations to deliver innovative services.

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Dean leads our real estate cost management in the region, supporting client's achieve their objectives in response to the of Saudi Arabia's growth and development towards its Vision 2030.

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Time to put sustainability at the **heart of procurement**

Catriona Riordan
Associate Director, Turner & Townsend

The climate emergency demands action and for the construction industry that begins with embedding sustainability goals in the procurement of programmes and projects.

The United Nations COP26 conference in Glasgow has amply highlighted the need to continue to work, with urgency, to tackle climate change.

We know the buildings and construction industry is responsible for more than a third of energy consumption and nearly 40 per cent of direct and indirect carbon emissions globally.

We also know that the construction industry has significant potential to deliver sustainable benefits to our cities and communities, natural environment and local and national economies. But turning words into action to mitigate environmental harms and enable a more sustainable future is a significant undertaking and requires an evolution of the business-as-usual outlook.

Forward-looking policies, from legislators, environmental and social governance (ESG) principles in business, and green financial instruments, are working to drive action to reduce carbon emissions and foster greater sustainable value and social justice. Now is the time for the construction industry to take action to deliver; ensuring programmes and projects set, and meet, sustainable objectives to address the climate and biodiversity crises.

The power to do this lies in the earliest stages of the construction process, specifically in the design and procurement stages, with raw material supply constituting to 50 percent of the embodied CO2e for the entire lifecycle. Traditional cultures, behaviours and practices have presented barriers to change in the industry, with procurement being dominated by the priorities of cost and programme. But with environmental, social and economic sustainability now rising up the agenda, a shift in focus is emerging and, in many regions, it is now becoming mandatory for procurements using public funds.

Leading the change

The construction industry has repeatedly demonstrated its capability to bring about dramatic change. Many governments have challenged the industry to improve health and safety on construction sites and setting the target of reducing deaths and serious injuries.

The industry met the target, overcoming the barriers, because government legislation and the senior leadership in client organisations and the construction industry drove the necessary change across the EU and North America in the last decade.

Today, sustainability is on a similar path, and we must act now. Industry leaders, particularly in client organisations, have a vital part to play in putting economic, environmental and social sustainability at the forefront of decision-making opportunities, to make it a major part of procurement with immediate effect and empowering their teams and the supply chain to follow suit. This empowerment enables procurement teams to weave sustainable objectives and requirements throughout the tender, contract documentation and contracts awarded to the most appropriate supplier, thereby utilising the procurement process to also deliver on the sustainability objectives of the planned investment.

Embedding sustainability **into tenders**

Tender and contract documentation provides the opportunity to set out sustainable objectives and key performance indicators (KPIs) for programme and project delivery. Some examples include carbon setting and calculation, environmental product declarations (EPDs), evaluation of construction methods (e.g. logistics planning, energy and waste minimisation), as well as KPIs for community engagement and job opportunities. This can be supported by developing value profiles and balanced scorecards to prioritise sustainability objectives and determine measurable KPIs for inclusion in procurements.

With immediate effect, sustainability ought to be a major part of selection criteria and sufficient weighting needs to be attributed to it in award criteria to reward tenderers who are adapting to meet the challenges. Sustainability requirements and criteria must be realistic about the capabilities and experience of tenderers, but also challenge the market to make the necessary step change and advancements if the construction industry is to meaningfully participate in addressing rising global temperatures and biodiversity loss.

Maturing the **supply chain**

Domestic and international supply chains contain highly variable levels of maturity with respect to sustainability integration in their service offering. For some, the transition to more sustainable processes and practices can present significant cost barriers. An example would be small and medium enterprises who may not be able to progress as rapidly as major contractors.

Early market engagement will enable client organisations to determine the supply chain capacity and capabilities to meet their sustainability objectives, to understand where they are on their sustainability journey and to enable the supply chain to adapt to meet the client's ambitions.

By setting out sustainability expectations and key performance indicators in contracts, the supply chain will need to integrate sustainability into their service offering to remain relevant and not lose out.

Getting real about risk

New technologies are being explored to help the construction industry achieve sustainability objectives, but the adoption of these innovative technologies and approaches can present risks for all involved in their development and application. There is a need to adopt a mature and balanced risk-sharing approach to encourage the market to invest and innovate in this area.

In addition, new products, systems and approaches need to be backed by certification – which is relatively new and, in some cases, not yet developed – to grant assurance that they are providing anticipated environmental impacts, carbon emissions or other benefits.

Understanding upskilling

The construction industry needs to keep pace with the legislative environment, client sustainability objectives and the continuing evolution of sustainable technologies and practices – in everything from retrofitting of buildings and homes to low-carbon concrete. This sustainable transition requires us all to develop new knowledge, skills and experience; we are all on the same journey.

Major organisations have the resources and capability to keep up to date, upskill their people and adapt the way they work. Small and medium sized organisations in the supply chain are unlikely to have such resources; however, it is important to understand their challenges and the support they may need. We all have a responsibility to take the industry with us.

Share the learning

We all face challenges in adapting to a more sustainable future. As we adopt more sustainable ways of working and given that time is against us, the sharing of experience, learning and ideas is critical. We need to work together to embed sustainability in procurement if the construction industry is to make its fair contribution to resolving the climate and biodiversity crisis.

We can drive change, by:

1. Setting meaningful and ambitious sustainability objectives and targets at an organisation level
2. Empowering procurement teams to turn objectives into reality
3. Engaging with the supply chain - and seeing how you can support each other
4. Incorporating performance regimes to motivate the supply chain

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Client interview

City Rail Link will set the benchmark for delivering **sustainable infrastructure in New Zealand**

Interview with

Dr Sean Sweeney
CEO, City Rail Link

The NZ$4.4bn City Rail Link project in Auckland is the largest transport infrastructure investment ever undertaken in New Zealand.

The project's Chief Executive Officer, Dr Sean Sweeney, explains why the new rail link is a game changer for the nation, doubling passenger capacity, opening up social and economic development and boosting employment across the commercial centre of New Zealand.

As a modern, expanding city, an effective and reliable public transport system is central to underpinning Auckland's economic and social growth, enabling the city to develop sustainably, and creating new opportunities.

The city has made considerable investments in its transport interchanges, bus networks and electrification of the rail network since 2000 to tempt drivers out of their cars and relieve congestion for the first time since the 1950s' tram-driven heyday. This change has created relentless growth – outstripping all modelling predictions – requiring a step change in investment to enable passenger capacity to keep up with projected patronage growth.

The City Rail Link (CRL) project is that step change in public transport investment. As a major public investment of NZ$.4bn, the new metro rail scheme will communicate the reduced congestion and lower pollution benefits of public transport to a growing, car-bound city population.

"It is a transformational project," explains Dr Sean Sweeney, Chief Executive of City Rail Link, the independent public sector organisation responsible for delivering the ambitious project. "It puts public transport first and firmly at the centre of the community."

Redefining public infrastructure investment

Proposals to improve rail access to Auckland's city centre have been around since the 1920s. However, the scheme accelerated after the 2012 Auckland Spatial Plan described it as the city's "most important transport investment".

The first tunnelling works for the project kicked off in 2016 as the result of the Auckland Council and then Mayor Len Brown taking a risk to start work without central government backing. This was needed to be able to incorporate the required tunnels under a large commercial development planned adjacent to the main city-centre Britomart Station.

Central government committed funding in 2017. With main construction starting in 2019, it is expected to be complete and ready to hand over to operator Auckland Transport late 2024/2025.

"This project is unique for New Zealand," says Sweeney, reiterating that over the last 30 years or more, the country has failed to invest in major public transport infrastructure projects.

> It recognises that roads - in particular toll roads - cannot solve the transport problems of the nation alone,"

he adds. "The rail system had been run down. People couldn't imagine living without cars, but now there's a modern railway planned they are pleased to change their view.

Sweeney was headhunted to join the project as chief executive in 2018 just after the New Zealand government agreed to be a 50:50 investor in the project alongside Auckland Council.

Under his guidance, the project will create a true metro train service. A 3.45km twin-tunnel up to 42m below the city centre turns the downtown Britomart Station terminal into a two-way through station, joining up existing lines to form a rail 'loop' around the city. This effectively doubles the existing capacity of Auckland's rail system and dramatically increases the number of Aucklanders with a commute of less than 30 minutes.

Initially the project was planned as a six-car system to carry around 14,000 passengers an hour. However, projected rail transport growth statistics suggested that by 2035, CRL stations will need to cope with 54,000 passengers an hour at peak travel times, prompting the project to scale up to accommodate nine-car trains.

"Auckland is growing inexorably and predicted to have a two million population very soon," he says, pointing out that even if post-COVID, 20 percent of people work from home on any given day, public transport is critical to the city development. "We are ensuring that what we are building is also facilitating appropriate development, not shutting it out."

Creating cost clarity

Sweeney's project delivery ethos is built around collaboration and working to a common purpose, and this sits at the heart of the Link Alliance delivering the project. A consortium of six private sector companies plus client CRL, it was set up specifically to deliver the main stations and tunnels for the project.

From the outset he was intent on also ensuring that the project is a game changer for New Zealand in terms of being delivered to expectation.

> Optimism bias is a normal hazard so that every major project starts with one foot in the grave," he says. "When I arrived, based on my experiences with previous major public projects, I told the Board I didn't believe the existing cost estimates. As a result, the Board asked me to advise what I thought the project might actually cost."

He quickly commissioned Turner & Townsend to carry out an independent cost review for him to really uncover the truth – as opposed to the hopes – about what this complex project was likely to cost.

"The Crown used their own advisers and came in within three percent of my estimate," he explains. "That essentially said we needed to spend NZ$1bn more. This included an additional NZ$250m for the nine-car trains.

The target cost for the project now sits at NZ$4.4bn, a figure that Sweeney accepts is still ambitious. However, he is also very open about the realities of the challenge and the need for engineers and project managers to be bolder about the challenges and benefits of investing infrastructure.

"More time and effort need to go into explaining how incredibly complex, risky and uncertain these ventures are," he says. "A single price and opening date can never be a certainty."

Images supplied by City Rail Link Ltd

Local employment game changer

Of course, no amount of pre-planning and pre-contract analysis could have predicted the COVID-19 pandemic, which Sweeney describes as "one of the biggest challenges on the project to date". With New Zealand closing its borders for the best part of 18 months, getting key people and key material through has taken a lot of effort.

Being a small nation, New Zealand typically relies on a transient workforce from Asia.

Even before COVID, the global construction boom meant that there was a shortage of civil and structural engineers, designers and architects. COVID accentuated the challenge, Sweeney explains.

Sweeney sees the City Rail Link project – New Zealand's highest value employment project – as having the ability to be a positive impact on the New Zealand construction industry. The scale of the project means that it can have a game-changing impact on lives and communities which have for too long been excluded.

In particular, he is committed to ensuring the project helps the indigenous Māori and Pacific Island communities to become more integrated by providing bespoke training and employment through the project's Progressive Employment Programme.

"I took a view that we should do whatever we could to even the table. I wanted to use the range and reach of the project to create employment opportunities," he says.

This outreach programme to support Auckland's indigenous communities also extends down the supply chain where Sweeney has committed to supporting Māori and Pacific Island family firms by removing many of the contractual or financial obstacles that prevent them being involved in large projects and bringing them into the project.

Securing New Zealand's future pipeline

Sweeney highlights that the success of City Rail Link is crucial to securing the future infrastructure investment pipeline across New Zealand. The lack of redundancy in the country's infrastructure and need to drive towards a net-zero carbon future, means it is vital that this investment goes ahead to reinforce the nation's ageing infrastructure.

"City Rail Link is probably the most ambitious project in New Zealand in terms of sustainability," he says, pointing out that in 2018 the project won New Zealand's top sustainability award. "The end state for us is absolutely green – the power that drives City Rail Link will be renewable, so we will be taking you out of your car and putting you onto a green mode of transport."

With its game-changing scale, complexity and cost, the successful delivery of the City Rail Link project is vital in building confidence in the industry that will be central to this future.

"New Zealand has never built an underground metro railway before, so we are into the unknown as far as our industry goes," he says. "Hopefully, it will be delivered in a way that gives successive governments confidence to invest in other big infrastructure projects."

Hydrogen hubs:

achieving cleaner, renewable energy

David Hodkinson
Director, Turner & Townsend

It is 60 years next September since US President John F Kennedy gave his famous Rice Stadium speech that fired the starting gun on NASA's Apollo programme with the words:

> "We choose to go to the Moon in this decade and do the other things, not because they are easy, but because they are hard... because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win."

The scale of the challenge that Kennedy set for his nation cannot be understated. As he pointed out, many of the technologies and materials needed to land a man on the Moon that decade, and return safely to Earth, still had to be developed.

As the global glow of the recent COP26 conference in Glasgow subsides, the parallels with today's challenge to turn the tide of climate change over the next decade are striking. Like the Moon landing, it is a challenge that appears impossible, has global consequences and that, as Kennedy put it, we must be willing to accept and unwilling to postpone.

Hydrogen: the element driving new energy thinking

It is increasingly clear that hydrogen will play a major role in decarbonising our energy system. Put simply, hydrogen will become central to how we store and transport that energy at scale, creating the kind of fuel flexibility and density that we currently prize from fossil fuels. It won't be the single, stand-alone solution, but one that helps to bring practical and economic sense to our net-zero ambition.

The reality is that the global demand for energy will continue to grow. Decarbonising energy supply means embracing a range of renewable power sources including wind, solar, tidal and nuclear as we electrify our economies.

Hydrogen's practical and economic potential cannot be understated as the energy mix moves away from fossil fuels. The inherent intermittency of solar and wind generation and the inflexibility of nuclear generation present challenges that hydrogen production can solve through effective use of surplus electrical power.

Locations rich in renewable resources but distant from demand centres can produce hydrogen instead of electricity. Shipping, heavy road haulage and aviation can use hydrogen as a primary fuel where direct electrification is not feasible.

Hydrogen hubs as the engine room of change

Carbon-neutral hydrogen production is, of course, the only long-term sustainable way to fuel the hydrogen economy. For this, we need large-scale renewable energy investments integrated into zero-carbon green hydrogen production, or the nuclear-powered pink hydrogen equivalent. In the short term, producing low-carbon blue hydrogen from the steam reformation of methane, combined with carbon capture and storage, provides an alternative solution to industrial-scale hydrogen production.

Hydrogen hubs, bringing together government, business, academia and local communities on a regional basis around industrial centres, lie at the heart of the acceleration and commercialisation of the hydrogen economy. They are the game changers, channelling public and private sector investment in a collaborative endeavour to develop and test solutions, and to drive industrial-scale hydrogen production and usage, while respecting local communities and nature.

The transition has already started

The good news is that hydrogen hubs are being established as part of national hydrogen strategies across all continents, providing a rich and diverse environment for technical, social and economic solutions to be generated. For example, hydrogen hubs have been set up in the established industrial clusters; South Africa has established the Hydrogen Valley hub running from the Limpopo to Johannesburg industrial corridor to Durban; the Australian government is sponsoring seven hydrogen hubs across the country.

Equally good news is the emergence of collaborations both at hub level, for example between South Africa's Hydrogen Valley and North East England's Tees Valley hydrogen hub, as well as country level, for example between the UK and UAE.

We are also seeing large-scale moves by corporates and governments to develop industrial-scale hydrogen facilities. Fortescue Future Industries is developing a global portfolio to support its target of producing 15MT/yr of green hydrogen by 2030. There are firm plans established in Oman, Saudi Arabia and UAE and to produce green and/or blue hydrogen at industrial scale, and oil and gas majors including BP, Chevron and Shell have hydrogen as a core part of their decarbonisation strategies.

Lessons from the Moonshot

The Moonshot was a loosely coordinated grouping of projects and support functions within NASA until in 1963 George Mueller created and ran the Office of Manned Space Flight under a single programme structure. Our current endeavour to develop clean hydrogen as a vital element of global decarbonisation needs to be addressed on the same programmatic basis.

Unlike the Apollo programme, establishing hydrogen as a vital element in the decarbonisation journey is not a single nation endeavour. And while this time we have the ability to harness the efforts and resources of the whole world rather than just a single nation, if we are to combat climate change, we need to establish the guiding mind – the NASA equivalent – to really drive the programme and keep us on track.

But who will perform the NASA role? This is likely to be a private-public body capable of enabling multi agencies to work together with the right level of funding and expertise on hand to demonstrate the economics and develop the technology.

NASA's success was also down to its relentless pursuit of a clear end vision – one that embraced innovation, pilot projects, with plan-do-review attitude, feeding in new ideas gradually and in a controlled manner.

COP26 – the end of the beginning

The United States delivered the moon landing within seven years of JFK's speech. We have nine years to get into shape to fix the climate.

COP26 was just a step along the way – the end of the beginning; COP27 must be the next step in moving away from fossil fuel dependence towards a new world of clean, sustainable and efficient power for our transport, industry and domestic futures.

Success will see us build on the COP26 consensus so that global governments feel free to share learning and innovation, guided by a clear programme management approach that builds market capacity through accelerated deployment of pilots and at-scale testing. This is not a single nation problem; we need the world to be inspired to collaborate to meet future energy needs and the climate change challenge.

The key to success is to dissolve barriers to collaboration between companies and nations to get people working as part of a coordinated global programme with a NASA-style guiding mind supported by a thousand leaders from all parts of the world making the difference to global decarbonisation as George Mueller did to the moon landing programme.

In his Rice Stadium speech, Kennedy said the conquest of space deserved

> "the best of all mankind, and its opportunity for peaceful cooperation may never come again".

Can we now agree the same about our collective challenge to address climate change, treating 2021 and COP26 as the end of the beginning, and 2022 as the year we started to take bold collective action.

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Takeaways

Tackling global climate change must be addressed with a **programmatic approach similar to that which helped the US Apollo mission land a man on the Moon.**

Hydrogen has a major role to play in **decarbonising our global energy system,** central to how we store and transport that energy at scale.

Hydrogen hubs lie at the heart of the **acceleration and commercialisation** of the hydrogen economy.

A NASA-style guiding mind is vital to build market capacity and keep the global transition to hydrogen on track.

Global collaboration is key to ensuring that hydrogen is part of the **vital decarbonised future envisaged at the recent COP26 conference.**

Client interview

University aims for top of the class in sustainability

Interview with

Jaco van Noppen

Director of Campus and Real Estate, Delft University of Technology

A major development programme is in progress at Delft University of Technology (TU Delft) in the Netherlands to make its campus carbon neutral and a circular economy by 2030. Jaco van Noppen, Director of Campus and Real Estate, gives an insight into the programme and how the university is drawing on its own scientific expertise to help realise its ambition.

As the Netherlands' first and largest engineering and technology university, TU Delft is a hotbed of innovation, entrepreneurship and excellence.

"We may be celebrating our 180th anniversary in 2022, but we're looking ahead by working to futureproof our buildings," says the university's Director of Campus and Real Estate (CRE), Jaco van Noppen. The futureproofing drive is transformational, as van Noppen is steering a decade-long, €650m development programme that aims to make its campus carbon neutral and a circular economy by 2030.

As well as meeting stretching environmental targets, campus buildings have to be flexible to accommodate future teaching methods and reflect the university's aspirations as a global centre of science knowledge.

To help realise these objectives, the university has adopted a ground-breaking approach to delivering its development programme; combining the research capability and knowledge of the university's own scientists and the external experience of a project management office (PMO).

Science of sustainability

The university's climate action plan covers all its activities, from the food served in its cafés to its real estate, and identified the latter as a significant contributor to its overall carbon footprint. "Under the 10-year programme we have 600,000 square metres of space that needs to be transformed, redeveloped or sold," says van Noppen.

The 160-hectare campus contains 60 buildings owned by the university, including notable mid-twentieth century examples of the work of architects Van den Broek and Bakema. "We have buildings that are architecturally iconic," acknowledges van Noppen. "But some dating from the 1960s incorporate a lot of concrete and from a sustainability point of view, they are difficult to transform to make efficient and carbon neutral."

In plotting the future of the campus and its buildings, the real estate team is working in co-creation with university stakeholders, who include both faculty teams and support services such as finance and human resources. But students and staff all have a potential part to play in shaping the future estate through their scientific research. "We are an innovative technical university, so a lot of the innovations and techniques in sustainability are coming from our young engineers," says van Noppen. "Both the campus and individual projects are field labs for our scientists." The campus already has a number of these field labs, including the Green Village, an accelerator of innovation for a sustainable future. At the Green Village, researchers, students, start-ups, entrepreneurs and government bodies work every day on the innovation challenges of today and tomorrow. The focus lies on the following three themes: Sustainable building and renovation; Future energy system; and a Climate adaptive city.

The field lab approach turns challenges into opportunities for innovative solutions. For example, a crowd management tool grew out of sensor monitoring across the campus to manage student movement safely in the pandemic. Now, this technology is helping to shape the design of the future campus. Scientists are being engaged with challenges throughout the development programme, says van Noppen, who adds, "It's an opportunity to think about the next thing, whether that's small wind turbines that can be attached to buildings or innovations in re-use of plastics."

Driving the development programme

When van Noppen joined TU Delft almost two years ago to lead CRE, the development programme had already been in progress for a year and was being managed internally. With CRE facing challenges in sourcing staff to manage this significant programme, it made sense to put a PMO in place.

The move enables the CRE team to build skills and expertise, as van Noppen explains.

Facts and figures about TU Delft

TU Delft has grown from a single building housing 48 students to become the Netherlands' largest university of technology, with more than 27,000 students and 6,000 employees.

Established in 1842 as a Royal Academy, the university expanded after the Second World War and now has eight faculties, located on a campus to the south east of Delft.

Its campus spans more than 160 hectares, being larger than the city centre of Delft itself, and houses numerous facilities such as educational buildings, laboratories, research bodies and associations, business space for commercial companies, hospitality facilities and student housing.

Business space includes a science park for start-up and scale-up businesses and De Bouwcampus, which is the home of innovation in construction and real estate. In all, around 250 companies, including global names like Microsoft, have a presence on the campus.

Key takeaways from this article

- **Co-creation is now a key word in real estate vocabulary**
- **A project management office (PMO) will take time to become established**
- **It is important to look beyond initial project cost to total cost of ownership to determine long-term sustainable value**
- **Continuity, quality and capacity are key performance indicators for the Campus and Real Estate (CRE) delivery**

"We want to be a strong real estate organisation, so we are stepping up in our professionalism, and that's also where a strategic partner comes in and can help in enabling improvement," he says. "An important key performance indicator (KPI) for me in directing this part of the organisation has been continuity, quality and capacity - those are the main things I need to control. If you have strategic partners, you have greater certainty that you can deliver."

One area of improvement targeted is increasing the implementation capacity and the speed of execution. The first year of the programme saw about €30m of construction work – which put it on a trajectory to deliver just half of the planned €650m of development. The PMO has since helped to boost delivery, to €50m in 2020 and €70m in 2021. "That shows the engine of the organisation is getting stronger," says van Noppen. As well as managing delivery of the development programme, the PMO is looking at how the resilience of the estate can be enhanced, so that it can better withstand market fluctuations and changes in the wake of the pandemic.

Raising ambitions through projects

Individual projects show how the university is developing its approaches to meet its stretching sustainability targets. An educational building on campus, called Pulse, has been designed for flexible learning – with student and lecturer input influencing the inclusion of such features as writable walls – and was the first energy neutral building on the campus. Solar panels, underground thermal storage, super-insulating glass, an intelligent building management system and a direct current network, developed with the university's own experts, have all been key to achieving energy neutrality.

Another project, the multi-purpose Echo building, takes sustainability ambitions further with its energy-positive design, which relies on 1,100 solar panels, high-tech glazing, thermal storage, mechanical ventilation with heat recovery and other advanced technologies. The building also incorporates re-used PET plastic bottles in acoustic panels on the internal walls, as part of the university's focus on using recycled or recyclable materials in line with circular economy principles.

As the university is a partner in the Delft Geothermal Heat Project, the campus is able to draw on geothermal energy for building heating. The source will also be linked to a major research programme aimed at the safe and responsible upscaling of geothermal energy as a clean energy source. The university is also working with the city of Delft to ensure biodiversity is enhanced through its interventions, for example by incorporating nesting boxes for birds, bats and bees in the facades of a new and demountable multi-storey car park.

Sustainable exemplar

A new €130m building for the faculty of Applied Sciences and many more projects lie ahead in seven more years of the development programme. The PMO has gone through its learning curve and is becoming established, van Noppen believes, bringing capacity, experience and improved reporting systems to the programme.

Future-proofing the campus has required a shift in project thinking, away from first cost to long-term value. "You have to invest today to avoid costs tomorrow. We've learned that if you don't talk about total cost of ownership, a lot of these investments are not that attractive."

Many lessons and innovations have already emerged from TU Delft and more will undoubtedly follow as its decade-long development programme progresses. These and the new buildings taking shape across the campus look set to make the TU Delft campus a global significant example in sustainability.

Client interview

Sellafield: a model for leading change in a complex world

Interview with

Richard Lennard
Head of Client, Programme and Project Partners (PPP), Sellafield Ltd

Sellafield Ltd is leading a 100-year project to create a clean and safe environment for future generations across the UK nuclear industry's vast research and development site in Cumbria. Richard Lennard, Sellafield's Head of Client, Programme and Project Partners (PPP) explains how its game-changing new procurement model will transform outcomes across its complex portfolios of construction projects, while also revolutionising the industry.

Since the world's first full-scale nuclear power station opened in 1956 at Calder Hall on the Sellafield site in Cumbria, the UK has been a global leader in the research and development of nuclear technology.

Today, the main focus of activity at Sellafield is the complex work being carried out by the Nuclear Decommissioning Authority (NDA) to contain and make safe the legacy of this past activity. In fact, around two thirds of the NDA's annual £3.65bn budget is committed across the site to deliver one of the most complex portfolios of construction projects in the world.

"Sellafield is at the heart of the nuclear industry in the UK," explains Richard Lennard, Sellafield Ltd's Head of PPP Intelligent Client, pointing out that the site has been central to developing the UK's nuclear skills base over the last 65 years. "The Sellafield nuclear site is the highest hazard nuclear facility in Europe and with the largest inventory of untreated nuclear waste in the world. Safely decommissioning the site is of strategic and national importance to the UK."

Driving value from a new delivery model

Sellafield Ltd, a subsidiary of the NDA, is responsible for operating and decommissioning work at the Sellafield site.

The capital investment includes the careful dismantling and containment of the numerous old buildings and equipment. But there is also a huge focus on designing, building and operating new facilities that enable the safe dismantling, processing and storage of radioactive waste arising from this task – essentially very large, complex and expensive stores in which to carry out the delicate work.

"The traditional approach to delivering capital projects is very transactional," says Lennard. "We were not getting the results we wanted on cost and schedule, and we suffered from lacking an ability to learn from our mistakes and from our successes."

The PPP procurement model is designed to tackle this problem head-on through ambitious long-term partnerships between Sellafield Ltd and four separate partners to deliver around 25 major projects over the next 20 years. A radical approach, PPP features no contractual break clauses, zero pain-share, and a guaranteed profit arrangement as the team tackles a complex programme of work across the Sellafield portfolio of assets.

Understanding the PPP Client

With an annual budget of £2.2bn and a programme stretching out over the next century, Sellafield's activities have been under the public spending spotlight.

"This is public money and the UK government expects us to deliver projects faster and provide better value for money for the taxpayer," explains Lennard.

Having realised that it needed a new approach to procurement, Sellafield worked with Turner & Townsend to design and implement the 'intelligent client' operating model. This started with scenario planning to really understand what Sellafield required from their supply chain and set out a structure capable of aligning, incentivising and rewarding teams behind this goal.

"The concept of this client model was deliberately designed to change the way governance and assurance is done," he explains. "We spent 12 months visiting other clients to see how they operate. Turner & Townsend then helped us to shape the goal and create the operating model."

A new approach to major project procurement

The new PPP model turns traditional major programme procurement on its head. The approach is one of carrots not sticks, putting early contractor engagement at the heart of the process and ensuring that true collaboration is central to delivery. By focusing on the behaviours that drive the right outcomes, it underpins faster, more effective project delivery, creates greater stability in design and construction supply chains, and promotes greater workforce flexibility, and local economic benefit.

The new approach kicked off in May 2019, with contracts awarded to Doosan Babcock Ltd, Jacobs (previously Wood), Kellogg Brown and Root Ltd (KBR) and Morgan Sindall Infrastructure. With a total forecast spend of £7bn, the PPP accounts for an average of 15 percent of Sellafield's annual site funding limit.

"The model is beginning to bear fruit with the partnership achieving firsts for the industry, setting the baseline against which delivery performance will be measured and incentivised. Five major projects have transitioned to PPP with more than 1,300 people mobilised and expected to increase to 1,900 this year."

Three delivery hubs have been established in Leatherhead, Warrington and West Cumbria, 98 long-term trade packs have been awarded to the supply chain and 50 graduates and apprentices have been recruited so far.

Changing behaviour is the game changer

The PPP model is central to driving change and ensuring that collaborative behaviour is built into the procurement – a factor that accounted for 30 percent of the overall contract assessment scoring based around 25 behavioural characteristics aligned to one of five themes of People, Leadership, Creating an Environment for Success, Outcome Focus and Collaboration.

> "We recognised that a robust evaluation of behavioural and cultural fit should be considered before embarking on a long-term strategic partnership. The longevity and high-risk nature of the works meant that it was critical that the capability procured embodied the behaviours essential to the success of the partnership model."

Lennard explains that the success of PPP comes down to realising the benefits as defined in the original PPP business case, which include predictability of project costs, high hazard reduction and an enhanced recognition of Sellafield's expertise and reputation. The aim is also to find new business opportunities at Sellafield, increase employment opportunities across the local supply chain, reduce carbon through sustainable practices and, of course, increase the value for money provided to the UK taxpayers.

"Over the lifetime of the project we're looking at double-digit savings," he says, pointing out that the model is a true game changer for Sellafield, but also potentially for the whole major projects sector – the key to providing greater value for money for the

taxpayer, for Sellafield's supply chain and for the local community.

"The PPP is now operating as a strategic enabler to the Sellafield Ltd mission," Lennard adds. "Landing the procurement and contract successfully means that the business can realise its ambition sooner – accelerating the high hazard mission and realising in excess of 10 percent, or £700m worth of savings to the UK taxpayer."

Mobilising a cultural shift

Across the supply chain all profits are now linked to the outcomes achieved for the client and by removing the threat of pain, teams can focus on finding and achieving the right outcomes. Sellafield turned to Turner & Townsend for support throughout the mobilisation of these new partnerships and to help forge a single effective organisation capable of meeting the challenge over decades, through creation of a mobilisation framework which set out what this emerging supply chain had to look like.

Both technical and behavioural alignment between the client and the partners was considered, with the new model immediately put to the test as three live projects were transferred across to the new team and new management regime. Working with Sellafield throughout this process, Turner & Townsend developed the operating model to ensure programmes remained on track and help the client team meet its targets.

Sellafield Ltd has also established and embedded a behavioural 'manifesto' to further accelerate this cultural shift.

Building capacity; building capability

The pace and complexity of the programme means that the capabilities and capacities across the supply chain is a top risk. Working with these trusted, long-term suppliers, provides huge opportunities to build the required skills across nearby communities, invest in apprenticeships and grow the industry from its grassroots. By having 20 years of sustainable employment in the design and construction supply chain, Sellafield can be confident that its partners will own that risk and invest to enhance that workforce.

The additional wider benefit, of course, is the ability of this long-term arrangement to help realise the economic ambitions of the local community, unlocking the local potential and so creating a new generation of nuclear expertise across the region.

"We are working closely with stakeholders and the local community to provide support to local SMEs to develop and grow these businesses," explains Lennard. "Social impact was embedded as an integral part of the contract model. As part of PPP, the supply chain will deliver billions of pounds in spend, we want this to have a significantly positive impact on the economic, social and environmental wellbeing of our communities."

A model of excellence

Sellafield has forged strong relationships with UK government, the Infrastructure Projects Authority and large infrastructure clients such as Anglian Water, HS2 and Network Rail, to share learning throughout the development of the PPP model.

As a result, the PPP model has been held up by the Institution of Civil Engineers and Infrastructure Client Group's Project 13 network as a successful 'early adopter' of its collaborative and integrated delivery model principles. Sellafield is considered an industry thought leader when it comes to innovative procurements of this kind and was asked to share its experience both nationally, with Crossrail and HS2, and internationally with the International Thermonuclear Experimental Reactor (ITER) project.

"From a personal perspective, developing a relationship with Project 13 has been one of the richest experiences of my career," says Lennard. "I am personally invested in making Sellafield's role as an 'early adopter' valuable to others."

Market focus

Saudi Arabia
a bold vision for hospitality development

Dean Furey
Director, Turner & Townsend

Globetrotters seeking the world's largest living museum or cultural heritage site could soon be heading to Saudi Arabia, as planning continues to make the Kingdom a leading tourist destination.

A series of real estate-based giga- and megaprojects providing not only hospitality development but new mixed-use developments, housing neighbourhoods and infrastructure, are being accelerated under the Kingdom's broad-ranging Vision 2030 strategy. The objective is to reduce Saudi Arabia's historic dependence on oil, diversify its economy and improve the lifestyles and opportunities of its people to 2030 and beyond.

One route to economic diversity is both domestic and international tourism and the Kingdom has, since 2019, opened its doors to visitors by issuing tourist visas and making substantial investments in resorts, hotels, attractions and the airports to support access.

This investment is intended to raise the contribution of the tourism sector to the Kingdom's gross domestic product to more than 10 percent, creating one million additional job opportunities and attracting 100 million annual domestic and international visits a year by 2030.

At the same time, the Kingdom is promoting a sustainable approach to hospitality development and tourism, which aligns with its pledge to achieve net zero by 2060.

What Vision 2030 means for hospitality

The scale of Vision 2030's ambition is unprecedented, with hospitality-related gigaprojects including the Red Sea Project, an eco-tourism development encompassing an archipelago of more than 90 islands, which is adjacent to another planned tourist destination at Amaala.

Hospitality and leisure amenities are also scheduled for other gigaprojects like Neom, a new city promoting entrepreneurship, and are being threaded through existing cities like Riyadh, where a green megaproject is seeking to increase green space through adding 7.5 million trees.

Many of these projects have yet to get under way, but construction is in progress on several sites including the Red Sea Project, where extensive research and activity has helped to enhance the marine environment.

Delivering best practice on a gigascale

The gigaprojects are being delivered concurrently and have initial delivery dates that are now just a few years away. Global best practice is playing its part in helping to bring forward major programmes, with the right project teams, procurement practice, project controls and commercial management being put into place to drive delivery to the objectives of Vision 2030.

Several projects are expected to offer extraordinary hospitality experiences, such as the overwater villas planned for the Red Sea Development and a hotel design set into a mountain in the Sharaan Nature Reserve in AlUla, designed by architect Jean Nouvel. Such innovative and high-quality projects will present their own challenges in delivery.

The creation of new cities and neighbourhoods is also presenting opportunities to build in latest thinking on future living from the outset, particularly around sustainability and digital innovation.

Gigaprojects are adopting circular economy principles, promoting the concept of regenerative sustainability in construction, so that they enhance the environment. Resorts may incorporate smart destination management systems to manage visitor movement and help limit negative environmental impacts from over-tourism.

Securing skills and expertise

Globally, the construction industry is facing significant skills shortages as development activity bounces back after the pandemic slowdown. The gigaprojects' scale and accelerated programmes make significant demands on skills and supply chains, with the Red Sea Project alone expected to require 10,000 construction workers as work progresses. This makes it imperative that supply chains are closely monitored across programmes.

Saudi Arabia's Saudisation programme must be taken into consideration, as it promotes the use of local workers and targets for the procurement of local materials and vendors. While the Kingdom has significant manufacturing capability for products ranging from sanitaryware to mechanical and electrical plant, challenges remain in the capabilities of some local contractors, especially for demanding ultra-luxury hospitality developments where companies may not have had the opportunity to gain relevant experience or know-how.

As well as exploring innovative ways of living, the Kingdom is promoting design for manufacture and assembly (DfMA) in construction, with the aim of leading the way in the adoption of modular approaches in the east.

Bathroom pods and other standardised elements could enable greater controls over design and installation quality in hospitality developments, as well as minimising waste. There are challenges in making a significant shift to DfMA, but the supply chain has an opportunity to grow as it develops in-house capability.

A blueprint for the future

These projects have the potential to drive skills development, employment and manufacturing capability, enabling SMEs to become larger businesses and driving a step change in Saudi Arabia's broader construction industry. In this way, construction will help to continue the social reform that has brought about transformational change in Saudi Arabia over the past five years.

Many of the resorts, hotels, museums, sports venues, parks and other amenities planned for the Kingdom are pushing the boundaries of what's possible in global hospitality and will set a blueprint for the future in their promotion of regenerative tourism. In their scale and their combination of modern architecture, advanced technology and sustainable construction, the giga-and megaprojects of Vision 2030 present unique opportunities.

Four tips to set up projects for success

- **Map out project timelines using multiple data sources. It is clear that data holds a multi-level significance for the construction's future. It can be the answer to a plethora of issues and can facilitate substantially the way we design, build and collaborate in the sector.**
- **It pays to take time to clearly define the project brief and the client's requirements from the outset, particularly when working to challenging timescales.**
- **Aligning - and realigning - project aspirations and budget from the outset will help to ensure expectations are fully understood.**
- **Accurate digital models can be crucial during the design stage, with the potential to incorporate building information modelling (BIM) and artificial intelligence (AI).**

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Q&A

Meet the change agents

We are living in an era of major global challenges, from increasing urbanisation to climate change to the fourth industrial revolution. All will have impacts for existing communities and our planet, and all require innovation and big thinking to develop sustainable solutions.

Against this backdrop, four of our future leaders highlight some of the ideas and innovations they and others are promoting to help to drive that transformation.

Rachael Hamann

Project Manager, Germany

Q What trends are influencing client-thinking now?

COVID-19 has forced us to rethink the way we design and use spaces and how we interact with them. Flexibility of use can extend the life cycle of a space and help foster social interaction and a sense of community. Existing building stock can be adapted, reused and refurbished, which helps reduce consumption of virgin raw materials, while still delivering exciting projects.

The global focus on sustainability is pushing our clients to set their sights higher. One way to ensure they are meeting their sustainability targets and stakeholder obligations is through certification, especially in environmentally aware business practices.

Q How are green and net-zero challenges being addressed in your region?

Any new analysis of a building will include a green/net-zero assessment, which will inform the next steps. Energy-efficiency certificates are just one key piece of information that can help develop strategies for the future of the building. At the end of 2020, Germany revamped its laws around energy efficiency in buildings. Net zero is the next step and we will continue to see it gain momentum.

Q Tell us what big changes or innovations you see coming.

Regulatory changes are going to be among the biggest drivers for innovation, whether to increase the efficiency of the current building stock or ensure new construction can stand the test of time.

We are likely to see increased flexibility and adaptability of designs with the use of modular buildings, and a decrease in demand for raw materials as many shift towards a circular economy approach. We will be more connected and have a deeper understanding of our surroundings than ever before; from what we use to build our homes to how we connect with others within local communities.

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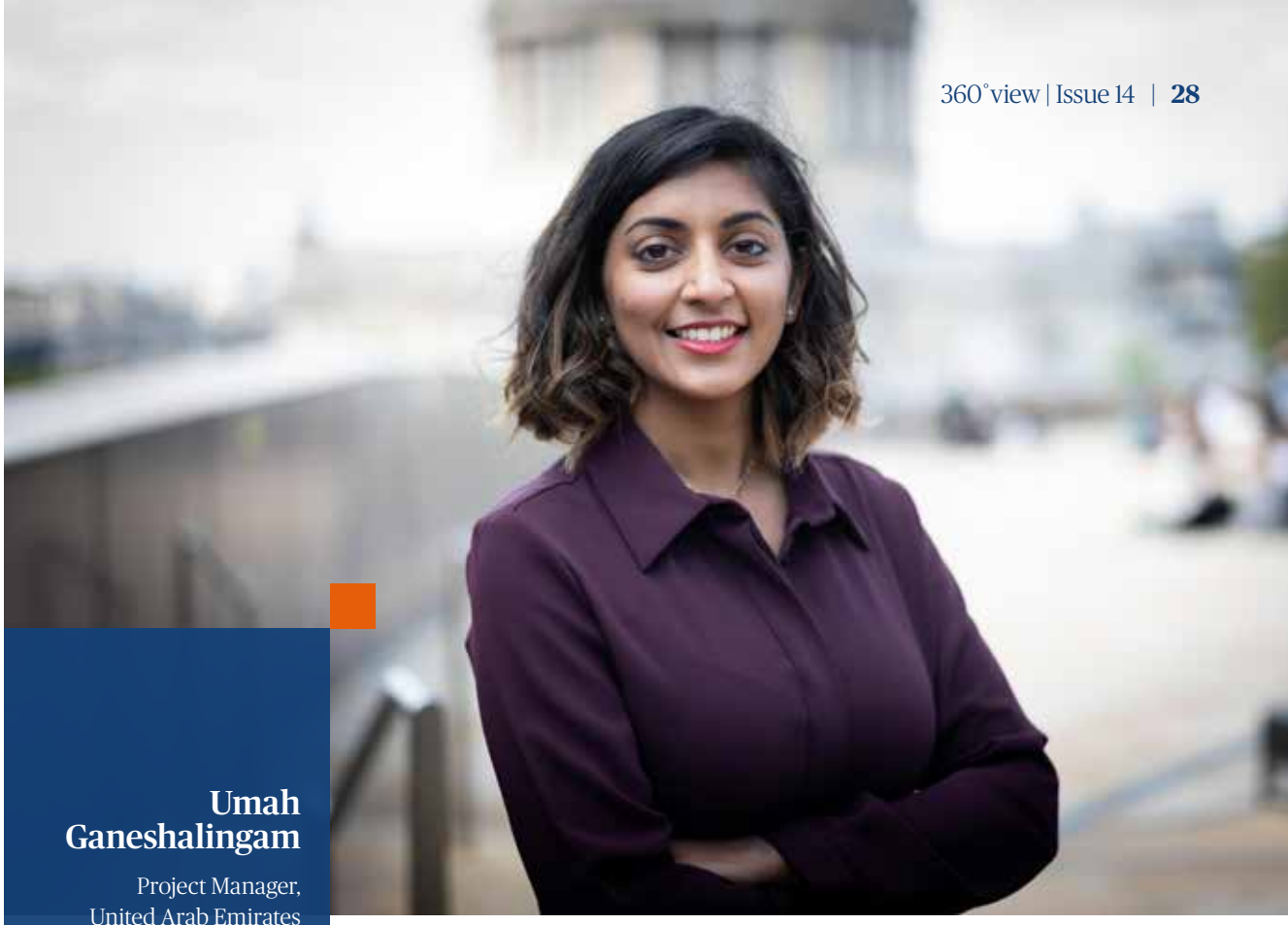

Umah Ganeshalingam

Project Manager, United Arab Emirates

Q How is the built environment being transformed in your region?

The United Arab Emirates (UAE) is preparing to host the United Nations Climate Change Conference, COP28 in 2023, with impressive visions emerging in all countries in the region to address net zero. The UAE Net Zero 2050 strategic initiative, which aligns with the Paris Agreement, requires the construction sector to have a multidisciplinary approach and collaborate with other key sectors, such as energy, manufacturing, logistics, waste and transport, to deliver efficient and sustainable solutions.

This will be particular important as the region embarks on an increasing number of mega-programmes, which are set to have broad socio-economic outcomes. These will be unprecedented in their complexity, with high cost, the region's reputation at stake and stakeholders expecting more from the industry.

Q What trends are influencing client-thinking now?

Efficiency is a key driver for most clients. Technologies such as unmanned aerial vehicles (UAVs) are becoming more available and affordable and can enable quicker construction, site monitoring and planning. Automation in data collection, augmented reality to visualise design changes and 3D printing on site can also help drive efficiencies.

These efficiencies enable us to demonstrate to clients the potential to move away from task-based approaches to become more performance and outcome-based. If we can do that, projects and programmes will be better set for success and it will unlock a new way of working in the region, where quality has higher priority.

Q Tell us what big changes or innovations you see coming.

Net-zero targets present a real opportunity to make changes to the use of more traditional approaches. I recently gave a presentation on the effects of noise pollution from the construction industry on our workforce and biodiversity.
We discussed solutions, such as taking a rigorous look at how the industry moves away from traditional materials and ways of working to ones that have less of an environmental impact. This makes me believe there is a great need for change management to be brought into these vital programmes early.

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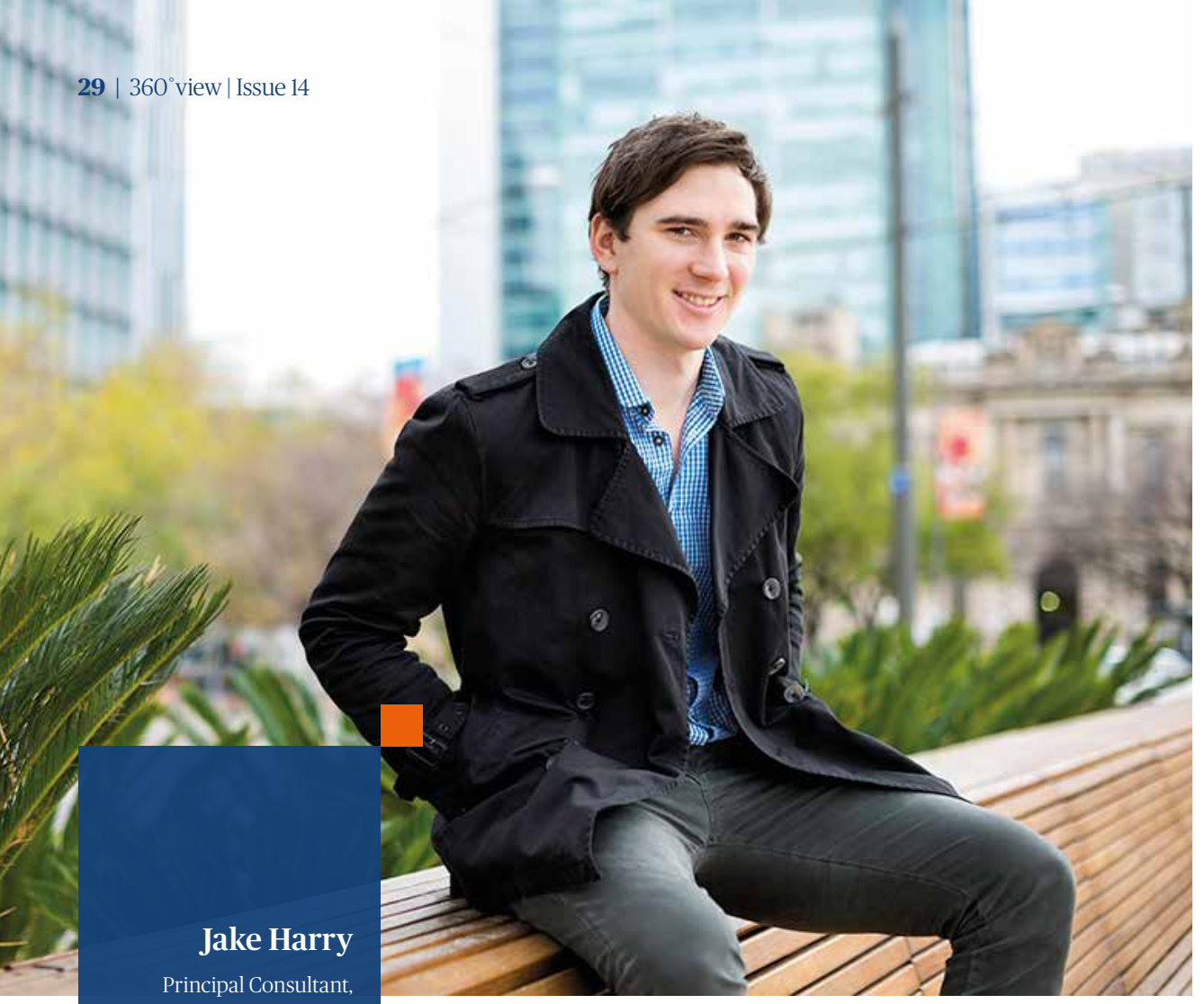

Jake Harry

Principal Consultant, Australia

Q How is the built environment being transformed in your region?

We are working with Infrastructure Australia (a department of the Australian federal government) to expand their Market Capacity Model. This body of work relies upon the collation and analysis of national project data to allow for resource demand forecasting. We are overlaying supply side data so that resource constraints can be identified during peak demand periods and providing advanced scenario outcomes, which illustrate how reusable materials can be utilised and current market sentiment towards them. The work has resulted in the reprioritisation of major infrastructure projects nationally.

Q How are digital tools and innovations helping to drive improvement in productivity and performance?

By working with our clients to transform their data and technology ecosystem we have been able to dramatically improve the performance of their capital investment portfolios. As a result of structured data management and automated analysis, it has become possible to develop more meaningful performance reporting across all sectors and business types.

Q How can we ensure projects deliver social value and inclusion for local communities?

I believe the ability to effectively manage and utilise data will continue to drive society closer to the smart cities model, changing the way people interact with the built environment.

There will, in essence, be a large-scale city investment map which helps direct funding, based on information recovered from the built environment. For example, key metrics around mobility, crime and retail activity can all be correlated to identify what investment will help areas provide greater outcomes for all users. This will give governments a TOTEX view on what investment is required in each city. They will also be able to run the model based upon different scenarios, such as high growth, economic downturn or stability.

This type of functionality will also see the advancement of 6D technology, so that virtual tracking of projects becomes more live time and impact analysis can be performed in a way that helps drive improved investment decisions and societal outcomes.

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Palesa Mabalane

Quantity Surveyor, South Africa

Q What trends are influencing client-thinking now?

Technology is helping to revolutionise the way we work; this is driving an increase in productivity and improving our collaborations. Another trend is data benchmarking – there's an increased need for planning and reporting based on historic data to drive performance and support effective decision-making.

Sustainability awareness is increasing across Africa. For instance, there's an interest in renewables and alternative fuels, as the continent explores more sustainable ways to solve the energy crises.

Q How are digital tools and innovations helping to drive improvement in productivity and performance?

Multidisciplinary teams with geographically dispersed team members are increasingly using collaboration tools remotely, which helps the team work together more effectively and improve project delivery.

More recently, we were able to support our Canadian team who are managing an LNG fabrication facility in China through a tool that helps to manage planned versus actual progress on site, increasing efficiency before and during the claims process.

Q Tell us what big changes or innovations you see coming.

Innovations that will continue to enhance efficiency and improve productivity. For example, improved value chains will be unlocked to optimise efficiency and automated supply chains will enable faster close-out and better project tracking, for example, digitising design and automating the production of materials off-site.

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Client interview

Transforming delivery of corporate real estate portfolios in Africa

Interview with

Rob Coetzee

Principal Head of Capital Projects, Absa Group

Absa Group is promoting best practice with a joint project management office (PMO), driving efficiency, sustainability and social inclusion in property development and fit-out, says Rob Coetzee. He explains how Absa is reaping the rewards.

Africa is one of the world's most dynamic emerging markets and has one of its fastest-growing populations, with the latter projected to double by 2050. It is expected that 950 million more people will be living in cities across the continent by mid-century.

As one of the continent's largest financial institutions and a force in Corporate and Investment Finance, Absa Group is playing its part in this economic growth. Supporting Absa's growth ambitions is a major Capital Investment Plan (CIP) for its commercial and retail property, with projects ranging from commercial fit-outs to the development of major headquarters buildings. Absa's Corporate Real Estate Services (CRES) is delivering these through a joint project management office (PMO) with Turner & Townsend, whose partnership is working to transform processes and outcomes for the bank's real estate portfolio.

Teambuilding to drive success

The PMO acts as a global capital projects client team and central project management office and control function, working with internal stakeholders to take projects from inception through to completion. The PMO team was reviewed when Rob Coetzee took on the role of Head of Capital Projects four years ago. "I inherited a team of competent professionals and looked at their capabilities, strengths, and weaknesses and built the team around those factors to ensure strategic momentum," he explains.

Having come to the company with international PMO experience, Coetzee had a clear objective. "My ethos has always been to develop the relationship in a way that forges a single team rather than a 'consultancy' role within Absa, with Turner & Townsend as part of the Absa team," he says. That team now has up to 30 dedicated personnel – depending on workflow and project demands – who cover quantity surveying/project management, administrative and related functions.

The engagement is driving diversity and social inclusion both through its engagement with the project supply chain and within its own team. It is supporting SME and qualifying small enterprise (QSE) businesses and skills development, working with them to develop products, such as furniture, helping them grow their brands and providing work, as well as finance. It has commitments to procure goods and services from black-owned and black women-owned businesses.

> "We are achieving exceptional results, transferring skills and helping drive transformation in the construction industry,"

says Coetzee. Internally, Coetzee's own determination to foster inclusion and young talent has resulted in a diverse team, where graduates and women are benefiting from exposure to best global practice and careers are being made.

Tapping into knowledge and data

Coetzee sums up the development environment in Africa as, "extremely dynamic and challenging," particularly when it comes to securing contractor capability, labour and materials, and COVID-19 has added to those constraints.

With Absa's operations spanning around 12 nations in Africa alone, it is important for the team to understand the cultural priorities of locations where it works, manage the expectations of stakeholders and at the same time deliver the bank's overall commercial objectives.

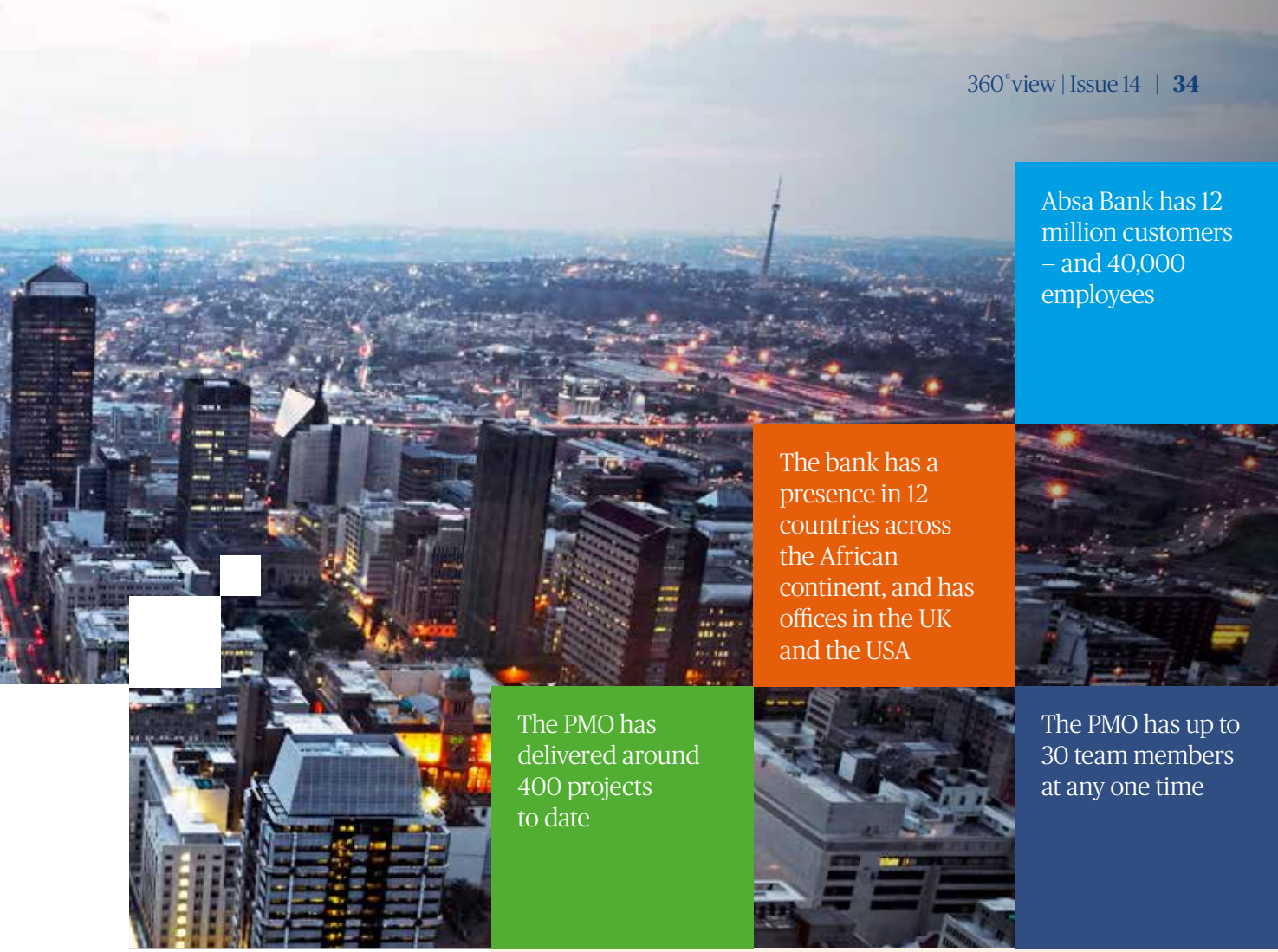
"It is a tightrope walk to ensure a balance is maintained and projects are delivered to satisfy all parties, budget, programme and quality expectations," recognises Coetzee. Key leadership qualities sought for projects are the ability to, "relate to the stakeholders, understand their culture and deliver messages in a way that it is well received and critically gains their support," he says. The PMO model is central here in enabling personality to be matched to projects.

But it is the access to global expertise, research, data and systems that is, for Coetzee, the core benefit of the PMO. "Wherever there is a challenge, I've been able to draw on experience of how it has been tackled," he explains. Up-to-date data has been critical in helping the PMO evaluate project costs and benchmark to drive best value across diverse locations. This, in turn, enabled Absa to develop its own internal benchmark rates report to help regional offices understand their costs and develop more accurate capital investment plans.

Absa and Turner & Townsend also collaborated to develop a digital tool for assessing workspace requirements. This innovation grew out of a recognition of the significant resource going into defining office space requirements and research by Coetzee into evolving ways of working. That resulted in a standardised specification and design, which was turned into the interactive Workspace platform, enabling new office space to be scoped, defined, visualised in 3D and designed and costed rapidly. Since its introduction in summer 2021, the platform has, he says, "revolutionised our interaction with our internal clients, transforming their understanding of our business and allowing them to visualise their new workspace".

A good and open relationship

Ask Coetzee how the PMO route has been so transformative for Absa and he cites the open and honest relationship between the partners. Although the team's make-up has changed over four years, he explains, "We have had succession in the leadership of the PMO team without having to draft new resources in. I judge the success of the team on this capability."



Absa Bank has 12 million customers – and 40,000 employees

The bank has a presence in 12 countries across the African continent, and has offices in the UK and the USA

The PMO has delivered around 400 projects to date

The PMO has up to 30 team members at any one time

Another factor that has contributed to the relationship's success is Absa's decision-making capability. "Absa is particularly good at empowering the department heads to run their businesses with an emphasis on agility, speed and accountability," says Coetzee.

To others considering adopting the PMO route in Africa, he says simply, "What are you waiting for? The benefits far outweigh the initial teething problems of mobilising a PMO and the access to skills, research and systems cannot be underestimated. The ability to scale up and down on resourcing and draft specialist resources into the business quickly and efficiently cannot be matched in a typical employer employee structure." The results speak for themselves.

Lessons for success:

Key takeaways from this article

- Co-creation is now a key word in real estate vocabulary
- A project management office (PMO) will take time to become established
- It is important to look beyond initial project cost to total cost of ownership to determine long-term sustainable value
- Continuity, quality and capacity are key performance indicators for the Campus and Real Estate (CRE) delivery

Market focus

A greener future for Ottawa's past

Building sustainable capital for Canada

Catherine Kelly
Director, Turner & Townsend

The government buildings of Canada's capital are going through a major refurbishment programme that is driving sustainable innovation, skills and green growth, and the upgrading of the Center Block is in the vanguard.

The Canadian government has set out a vision for a greener future as it continues to steer the nation along its trajectory of solid economic growth. Its 2030 carbon emissions reduction plan targets an overall reduction across the economy of at least 40 percent below 2005 levels by 2030 and net zero by 2050.

Progress towards sustainable ambitions is being driven on many fronts, for example, new national construction codes introduced in March allow encapsulated mass timber construction up to 12 storeys. Notably, the government is leading by example with a major investment in the upgrading of its own Parliamentary and Judicial Precincts in Ottawa.

Under its Long Term Vision and Plan (LTVP), heritage buildings are being restored and brought up to date and advanced technologies adopted to create a more environmentally, socially and economically sustainable parliamentary estate. Alongside this, the district heating and cooling system serving federal buildings in the Ottawa region is being made cleaner and greener. These projects are designed to help the government department responsible for real estate management, Public Services and Procurement Canada (PSPC), meet its pledge to achieve carbon neutrality in its real estate portfolio by 2050, in line with the government's vision.

Cleaner, greener heating and cooling

The modernisation of the aged district energy system demonstrates how the government is working to drive cost-effective, sustainable and innovative solutions. Upgrading of the system, which provides heating to 80 federal buildings and cooling to 67, is expected to cut greenhouse gas emissions by more than 60 percent.

The Energy Services Acquisition Programme (ESAP) will see the heating system converted to a more energy-efficient, low-temperature hot water network and the Ottawa River helping to chill water for cooling. In the future, the heating system could move to greener renewable energy sources.

Towards more sustainable buildings

Ottawa's Parliamentary and Judicial Precincts contain 35 Crown-owned buildings, many of which are more than a century old with 28 being designated heritage buildings. Four major buildings have already been upgraded under the LTVP and the biggest project to date is in progress, which is the sustainable refurbishment of Center Block, Canada's main parliamentary building.

Here, PSPC has identified wide-ranging sustainability priorities, including promoting health and wellness through environmental quality, climate resilience, carbon neutrality and environmental and resource stewardship. Environmental targets sit alongside social objectives, which include engagement with indigenous peoples during project delivery, enhancing building users' experience through the application of technology and systems and increasing accessibility for all ages and sectors of society.

Expected to cost around CAN$5bn and take almost a decade to complete, renovation of the iconic gothic revival Center Block will ensure its Nepean sandstone exterior and other precious features – some up to a century old – will be safeguarded for the future. At the same time, earthquake resistance and fire safety are being brought up to modern standards, mechanical and electrical services replaced and an advanced digital infrastructure added.

For a project of this duration, it is inevitable that technologies and client requirements will evolve throughout delivery. Flexibility has been designed into the project and the potential impact of technological advances, in key areas like mechanical and electrical plant, is already being considered. Inevitably given its stature, this project has many stakeholders, including parliamentary partners and an independent architectural review panel of leading architects, and cost management and analysis and reporting tools are essential to not only managing but also communicating cost, time and risk. Our Ottawa office is supporting PSPC on the Center Block Rehabilitation Program, as well as a number of other high-profile programmes across the city.

Growing skills, innovation and the market

Center Block is a trailblazer, demonstrating how heritage buildings can be made more sustainable and inclusive and at the same time providing a catalyst for the development and application of a range of skills and technologies.

We are leading the project controls function including cost, time, risk and reporting services, alongside more than 500 companies already working on the multibilllion-dollar programme from across Canada. The programme will increase the construction market in Ottawa and, it is hoped, generate a legacy of craftsmen and women – particularly indigenous peoples – who will continue working in the Parliamentary Precinct for decades to come. Demonstration of approaches, technologies and innovations here will encourage others across Canada to follow the government's lead, ensuring that both new build and refurbishment activity plays its part in tackling climate change and driving sustainable growth.

Greening Center Block

As one of the least energy-efficient buildings in PSPC's real estate portfolio, Center Block needs radical intervention to bring it up to current sustainability standards. The refurbishment programme is targeting LEED environmental certification – with the highest possible rating of Platinum – together with carbon neutrality, a 75 percent reduction in energy use and a halving in indoor water consumption.

- **More than 1,600 windows will be replaced, insulation added to walls and roof and a new air conditioning system installed.**
- **A network of geothermal wells will store excess heat energy from the building for re-use.**
- **Courtyards will be closed in by adding glazed roofs, decreasing the building's external wall area by more than a third and reducing heat loss.**
- **Other green technologies under consideration include solar photovoltaic panels on the courtyard glazing and a greywater recycling system to water the lawn fronting Center Block.**
- **Materials are being sourced locally where possible to minimise carbon footprint, and many will be crafted by indigenous peoples.**

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Where legends are made: The future of stadium design

Interview with

James Hamilton
Director, Global Host Cities and Venues

Major sporting events are often remembered for the performances played out in front of huge numbers of fans, but the stadiums and arenas where they take place should also be acknowledged for the part they play in delivering successful tournaments and more sustainable communities.

Stadiums and arenas have become much more than simply venues for major sporting and cultural events; they have a central role in the social and economic sustainability of their communities. They are stages for sporting brilliance and have become part of the fabric of their local communities; places where people come together to feel connected and inspired.

Top sporting events and venues can provide catalysts for change and future development, as the South Africa 2010 FIFA World Cup and London 2012 Olympic and Paralympic Games so powerfully demonstrated. Stadium owners and cities hosting major events are now looking to create more innovative, sustainable and multipurpose facilities that can attract the crowds, be delivered cost effectively and leave a broader legacy in sustainable regeneration and placemaking.

So, how do these trends impact the design and construction of the next generation of venues?

Harnssing the home advantage

Creation of a new facility does not always have to be the default decision for stadium owners and host cities. Stadium owners need to take a long-term sustainable view, as well as recognising the power of emotional factors, such as local fan loyalties and heritage.

The Birmingham 2022 Commonwealth Games will include a significant redevelopment of the city's existing Alexander Stadium, in the Perry Bar area of the city. After the games, the stadium will be adapted to its legacy mode to provide a permanent capacity of 17,500. The city has also come up with an innovative and sustainable alternative to the convention of building an athletes' village, which is based around re-use of existing student and hospitality accommodation in the city.

Like the London 2012 Olympics, the Birmingham 2022 Commonwealth Games is accelerating sustainable regeneration across the wider Perry Barr area with a new residential neighbourhood of more than 1,000 homes and improvements to public transport infrastructure being aligned. Birmingham City Council believes the games' impetus and infrastructure could kickstart housing growth in the area, potentially paving the way for a further 5,000 new homes.

Build it and they will come?

Building new stadiums and arenas has the clear advantage of providing a blank canvas from which a full precinct-based approach can be developed, with accessibility, transportation, modern infrastructure, safety, security, broadcasting, field of play, spectator viewing and fan experience all being blended into an optimised design.

The eight stadiums for the FIFA World Cup Qatar 2022™ are being created in new precincts (except for the existing Khalifa International Stadium which has been expanded to meet FIFA World Cup Qatar 2022™ hosting requirements), equipped with such amenities as schools, sports pitches, mosques and parks. The approach, which is part of Qatar's 2030 national vision for a legacy for Qatar and the Middle East, aims to maximise the positive impact of the event through sporting facilities, infrastructure and an outreach programme.

The eight stadiums, ranging in capacity from 45,000 seat (gross) venues to the 80,000 seat Lusail Stadium, designed by architects Foster + Partners and Populous, have all been created with legacy in mind, with demountable top tiers and removable seating. The Ras Abu Aboud Stadium has a 'flat pack' design and construction made using modular steel and modified shipping containers, some of which were used to transport its materials. This sustainable and innovative design, by Fenwick Iribarren Architects, can even be completely dismantled after tournament use. The stadium and other demountable elements are destined to go to developing countries after use, further extending the tournament's sustainable legacy.

Pitch perfect

At the centre of any stadium is the field of play, and technology is now driving advances in pitch and turf development to the point where whole pitches can be removed and re-laid in rapid time to allow for back-to-back games on perfect surfaces.

Certainty of play is also paramount to ensure commercial and broadcasting obligations are met, as well as guaranteeing revenues can be maintained without loss of income from cancellation due to bad weather. For some tournaments, such as the FIFA World Cup™, under-pitch vacuum extraction systems are required to enable rapid removal of water following heavy downpours and flooding. Retractable roof structures are also becoming more prevalent in stadiums and arenas, as well as induced cooling systems, artificial or hybrid turf technology and 'rapid grow' lighting.

Enhanced experiences

Technology is a key enabler in creating enhanced experiences more broadly. Qatar has explored the potential to incorporate new technologies into the 2022 event through an innovation programme for entrepreneurs. The fans of the future will be expecting so much more in the new 5G era and stadium owners themselves are placing a growing emphasis on applying technology to make it quicker and easier for fans to pass through ticket barriers and buy food or drinks.

The opportunities for enhanced commercial routes to market will increase, providing more streams of revenue. The effect of technological advances on commercial partnerships and broadcasting rights will be significant as the drive for real time, live and multi-channel formatting comes into play.

Delivering next generation venues

Just as athletes put years of dedication and training into their sporting performance, so the creation of major event venues can require a strong vision and drive, long-term strategy, and investment at multiple levels. From our work with venue owners, developers, event organisers and host cities over the last decade, we have identified three key considerations:

1. **Planning ahead, future-proofing and pay back** are fundamental ingredients of success. A programme to convert the site and facilities of a major sporting event from games mode to legacy mode may take 20 years or more. Getting the strategy and set-up right is essential to ensuring the programme stays on track, risks are controlled and value is delivered.

2. **Safety and security** should be factored into the design process from an early stage. Getting the right blend of seating, safe standing, crowd movement, accessibility, unrestricted viewing and dedicated fan areas inside the bowl create an exciting atmosphere. COVID-19 will also, inevitably, have an impact on the design of stadiums and their surroundings into the future. Designers will need to examine the flow of spectators arriving at and departing from a venue, addressing transport systems and hubs, pedestrian areas, entry and exit routes themselves, maximising opportunities to create more space and segregation.

3. **Sustainable design and construction of venues** must also be considered very carefully. Games and legacy uses allow the opportunity to integrate modular and demountable solutions to allow for speedy delivery, different formats of sport or entertainment and future conversion.

Back to the future

The eyes of the world are on major sporting events like the Olympic Games and FIFA World CupTM. Delivering the stadiums and facilities for the main event cost effectively, while also preparing for legacy uses, calls for innovation and lasting commitment. With advanced technology, sustainable design and long-term commercial strategies in place, stadiums can provide a great seat for the games, a sustainable multi-purpose destination and a focus for area-wide economic and social benefit.

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