

# Net Zero in UAE Construction

August 2022



# Foreword

The decarbonisation agenda is reshaping the planning and delivery of projects in the UAE



**T**he need to decarbonise sits firmly at the top of the policy agenda in the UAE, which is set to host the COP 28 climate change summit in November 2023 and aims to achieve net-zero carbon emissions by 2050.

Decarbonisation will define the next phase of project developments in the UAE, as well as across the wider region. Project sponsors will have to work with government authorities to ensure that projects are designed, built and operated in line with national net-zero targets.

At the same time, however, the industry is still grappling with the legacy of the Covid-19 pandemic, including supply chain bottlenecks and inflationary cost pressures. Meanwhile, challenges that existed even before the pandemic – rising costs, shortage of skills and hesitance to adopt technology – continue to linger.

For clients, contractors, designers

and suppliers, there is a need to rethink traditional practices in order to succeed. And, among other things, it will require reassessing the way that projects are delivered, while remaining attractive to global investors.

On 9 June, the MEED-Mashreq Construction Business Leaders Club brought together leading figures from across the UAE's construction industry to consider the impact of the decarbonisation agenda on the projects industry, and to discuss how the UAE construction sector can contribute to achieving the country's net-zero ambitions.

Experts further discussed practical actions that can be adopted by the industry in the near-term to kickstart the journey to carbon neutrality.

This report summarises key themes discussed at the event and presents trends and opportunities ahead for the sector.

# Decarbonisation in Mena construction

The projects market must incorporate sustainable practices in the planning and delivery of projects



## SOURCE OF CARBON EMISSIONS



CONSTRUCTION AND OPERATIONS OF BUILDINGS



CEMENT PRODUCTION

Source: Global Alliance of Buildings and Construction

As countries around the world commit to reducing their carbon emissions, the impetus to do the same is trickling down to individual sectors.

In the Middle East and North Africa (Mena), the construction and infrastructure market now finds itself at a turning point where it must align itself to national visions and climate change targets.

The job is easier said than done. These sectors remain dependent on conventional processes, consume high amounts of energy, and generate a considerable carbon footprint.

For example, cement production alone is responsible for nearly 8 percent of all carbon emissions – in the UAE, it accounts for 6-7 percent of the national carbon inventory.

And according to the Global Alliance of Buildings and Construction, the construction and operations of buildings contributes to 37 per cent of energy-related carbon emissions.

Clients and larger engineering consultants are increasingly driving top-down change by incorporating or mandating sustainability requirements into their building regulations and designs. However, in practice, cost pressures mean that contractors and suppliers do not always receive the right support and incentives to adopt sustainable construction.

### Reassessing priorities

This has been compounded by the market's performance over the past half decade. Since the 2014 oil price crash,

the construction sector has witnessed a considerable decline in contract awards of more than 40 per cent.

Lower government capital expenditure has created an environment in which many clients have focused on building projects to time and with budgetary constraints rather than in a sustainable manner.

This will have to change going forward. Driven by strong demographic growth, demand for greater infrastructure capacity, economic diversification and the transition to cleaner energy, construction represents \$2tn, or 52 per cent, of the region's future projects pipeline according to regional projects tracker MEED Projects.

Critically, governments now have the

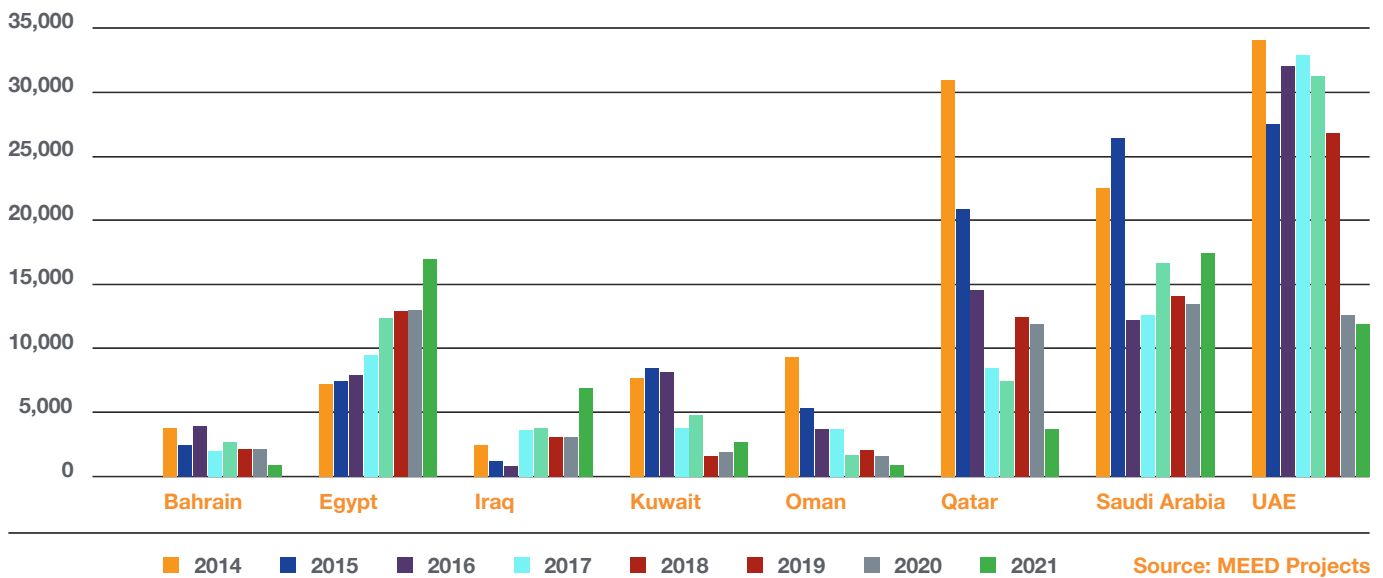
funds to finance their project ambitions. With crude at more than \$100 a barrel, nearly all Mena states are expected to post a budget surplus in 2022, much of which will be allocated to capital expenditure.

Therefore, individual countries in the Mena region have the ideal conditions in place to set and meet their net-zero targets.

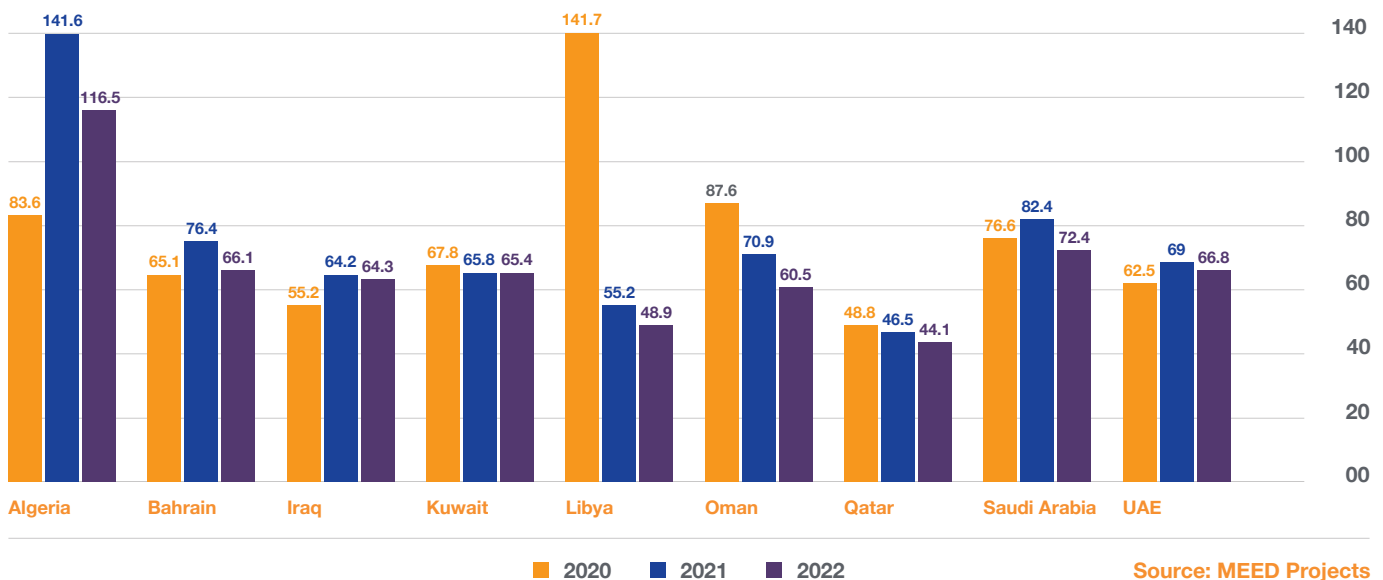
But to achieve these, they will have to become less dependent on fossil fuels and invest more in renewable energy sources, carbon capture, and carbon offsetting.

Of particular interest is hydrogen, seen as key to achieving carbon neutrality and boosting non-oil trade. In the immediate future, the focus is expected to be on producing and exporting hydrogen fuel to

Comparison of construction contract awards 2014-21 (\$m)



Fiscal breakeven oil price (\$/barrel)



“In the post-pandemic recovery phase, survival remains the priority for many project-focused businesses.”



markets including Europe and East Asia.

Likewise, it is crucial that sectors such as construction collaborate with their policy-makers to devise effective strategies and create a cohesive strategy to build more sustainably.

The UAE aims to become a net-zero economy by 2050, and recently launched the National Dialogue for Climate Ambition (NDCA) to define and advance sectoral inclusion in achieving the target. Such platforms provide an opportunity for the industry to work closely with the government in realising common goals.

In the short-to-medium term, organisations must enforce their own business strategies centred around decarbonisation. This could include mandating alternatives to carbon-intensive

building materials, introducing carbon metrics on projects, and investing in upskilling and training of their workforce.

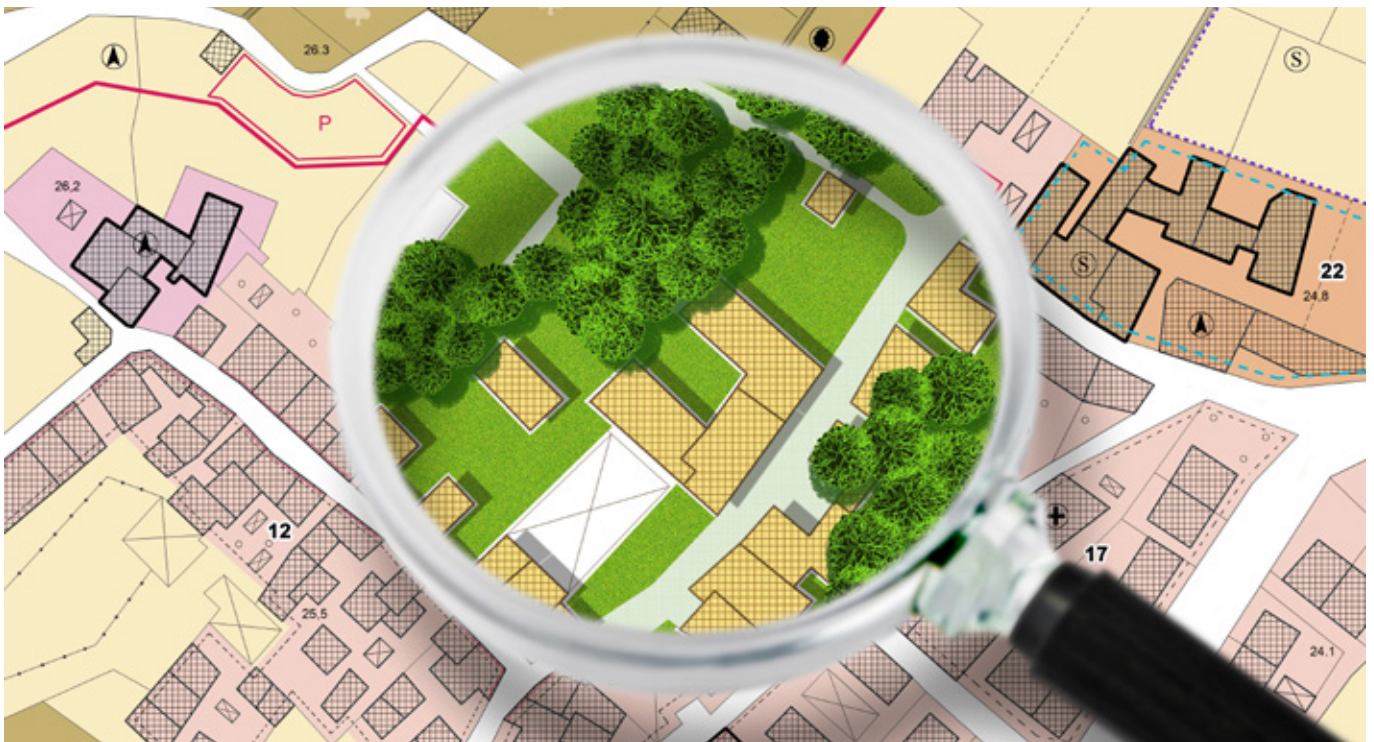
Technologies also have an important role to play in lowering costs and improving efficiency. These include whole life-cycle building information modelling (BIM), digital twins, and use of solutions such as 3D printing, drones and predictive monitoring systems.

In the post-pandemic recovery phase, survival remains the priority for many project-focused businesses. But with the market entering a growth phase, they ultimately have very little choice but to act now if they are to deliver on their net zero promises.

Considerable investment may be required up front, but the benefits will undoubtedly be reaped in the long-term.

# Construction must drive net-zero in cities

The industry needs to work with the government to align smart, urban cities with net-zero ambitions



## SOURCE OF CO2 EMISSIONS



**URBAN CITIES (INDUSTRIAL AND TRANSPORT SECTORS)**

**T**he UAE construction sector must play a pivotal role in mitigating carbon emissions generated by cities, according to a group of leading industry experts in Dubai.

Speaking at the Construction Business Leaders Club on 9 June, built environment specialists in the UAE emphasised the role of construction firms and their funding partners in leading the way forward for smart, net-zero hubs.

According to estimates by the World Economic Forum, urban cities today account for nearly 70 per cent of CO2 emissions. Much of this is attributed to industrial and transport sectors, and rising population levels are expected to result in even higher energy consumption levels and a further increase in emissions.

Industry experts note that transformation of business models and legislation will help shape the way forward.

Most crucially, there is a need to change mindsets when it comes to achieving net zero in construction.

“The projects market needs to shoulder more responsibility and engage in planning and delivering sustainable developments,” said a representative from Mashreq Bank during the gathering. “Be it as planners, contractors, suppliers – and yes, as banks as well.”

### Encouraging change

In the Mena region, countries including the UAE have been driving actionable change in the net-zero space.

Led by the Ministry of Climate Change &

“Many strategies have been founded on a solid economic basis but have a decreasing marginal return because as we increase the standards of new buildings the payback time becomes longer.”



Environment, the UAE's Net Zero by 2050 strategic initiative makes it one of the few oil producers – and the first in the region – to pledge its commitment to reduce and offset greenhouse gas emissions.

Experts note that achieving national objectives will not be possible for the governments alone; private sector participation is necessary. One such opportunity for the construction sector is greater involvement in energy generation and demand side management initiatives, underway across the UAE.

For instance, in 2018, Ras al-Khaimah introduced its Energy Efficiency and Renewables Strategy 2040. As well as a busy programme of new green building and energy management regulations, it includes initiatives such as an energy performance rating platform that offers green development incentives to accredited energy services companies (Escos).

A government representative from Ras al-Khaimah said at the club: “We realise that construction needs a much more centralised approach, which can only be achieved once we move from a market push to a market pull dynamic that encourages initiatives such as landlord incentives to retrofit efficiency measures into existing buildings.”

The emirate is retrofitting public buildings to become more energy efficient. It is also considering waste-to-energy and solar

heating programmes as well as deploying electric vehicles and charging stations. Similar programmes exist in Dubai and Abu Dhabi as well.

Limitations persist, and the government recognises these must be overcome.

“Many strategies have been founded on a solid economic basis but have a decreasing marginal return because as we increase the standards of new buildings the payback time becomes longer,” added the Ras al-Khaimah representative.

“The business case must recognise that there are limits to the return on these developments and make it clear that they can become less economically viable for investors.

“That’s why we’ve been advocating more ambitious targets for the GCC region from the beginning – and why we published our viewpoint strategy at the beginning of last year. The net zero emission targets of the UAE are quite remarkable because they represent a shift from a pure economic focus to a climate change focus.”

“Higher oil prices mean surpluses in government budgets, providing us the opportunity to think about the future and to invest more in supporting developments that offer a decreasing level of marginal activity,” said the representative.

#### Imparting knowledge

Expo 2020 Dubai showed the world the

**“Decarbonising homes for instance, requires effort and intrusion. Switching to an electric vehicle needs accessible and affordable charging.”**



vision that the region has when it comes to smart cities. But for initiatives to turn into a way of living, consumers must be made aware that their action is matched by input from government and businesses.

An engineering consultant at the club said that organisations have considered their carbon footprint out of fear of being penalised for non-compliance with Scope 3 reporting requirements under the GHG Corporate Protocol.

“This has prompted organisations to make investment where needed, confident that they will receive equally significant downstream support for it,” said the consultant. “But that discussion needs to start by allowing the public to assess the benefit in tangible ways.”

Decarbonising homes for instance, requires effort and intrusion. Switching to an electric vehicle needs accessible and affordable charging. For consumers, change comes down to being a matter of convenience, say experts.

Another consultant at the club pointed out that the UAE punches well above its weight in terms of its influence on the developing world. In many ways, he told the

attendees, Dubai is seen as a trailblazer for many countries.

“But with that comes a requirement to lead the way in the right way,” he said. “I don’t think that we’ve been very good so far at painting that picture of what future cities are going to look like. We need to show them and tell them that while it might not look attractive, it is nonetheless the destination.”

Lessons can be adopted from cities such as Copenhagen, Barcelona, and Milan, where the approach extends beyond green tax credits, green mortgages, and green building materials.

Environmental legislation, government policy, municipal planning and public-private alignment drive every stage of the eco-innovation and education journey.

But the forum also warned that while cities remain society’s beating heart, they can expect to face mounting scrutiny in coming years. Their best response is a meaningful plan for integrated energy solutions, backed up by ambitious policy and urban planning. And this will only be achieved through transparent and accountable projects involving governments, funders, and service providers.





The Construction Business Leaders Club by MEED-Mashreq gathered in Dubai on 9 June



# Retrofit can become a realistic route to net zero

Retrofitting can serve as the stepping-stone to achieving a net-zero carbon future



**A**s the costs attached with meeting net-zero goals become clearer, built environment specialists are prompting stakeholders to consider the benefits of building retrofits.

UAE-based experts at the Construction Business Leaders Club emphasised the role of construction firms and their funding partners in exploring options to give existing properties a new lease of life.

#### **Retrofit provides gains**

The World Green Building Council (WGBC) highlights that landlords in major cities including Vancouver and London are trying

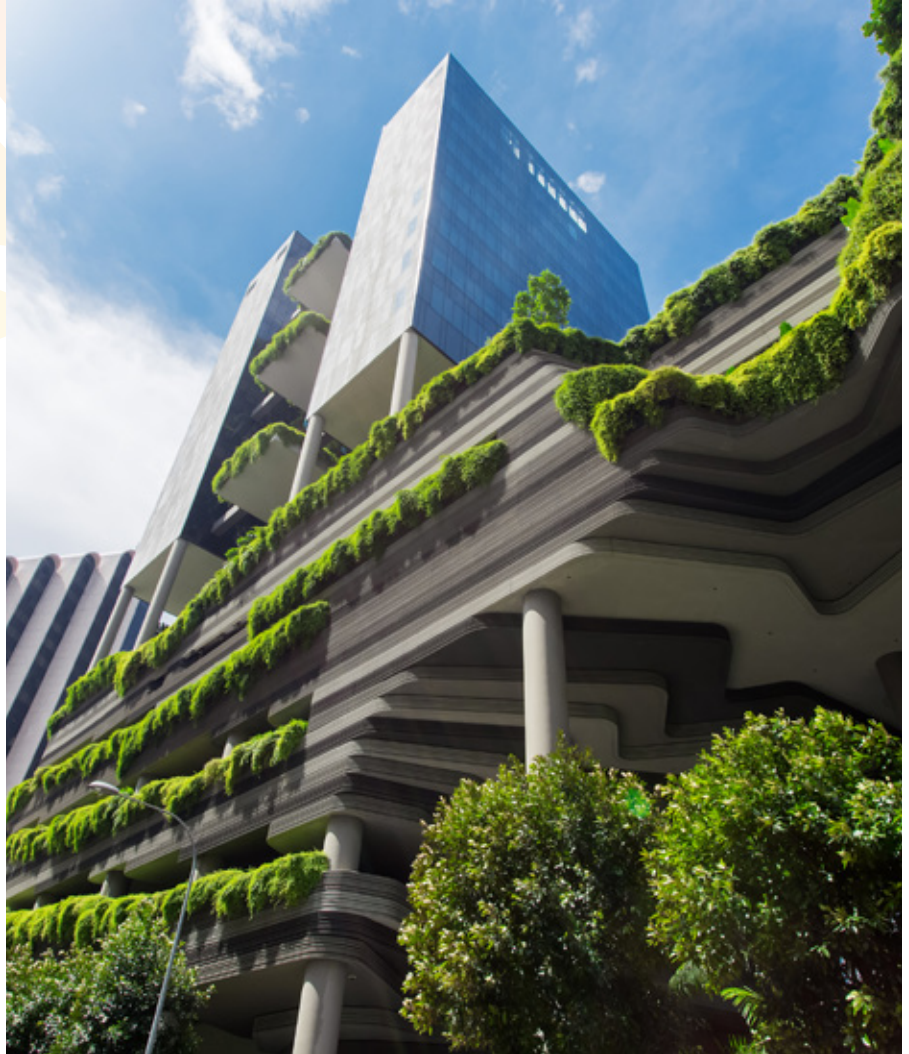
to meet increasing consumer demand for more efficient buildings by revamping existing spaces.

Changes include insulation and solar panels, LED lighting upgrades, low-flow water fixtures that help regulate water usage, and sealing and weatherising the building's envelope to create a better separation between the outdoor air and the conditioned ambient air.

Integrating these with enhanced digital infrastructure can further bolster operational performance and improve maintenance practices.

Estimates by the American Council for an

“Governments must consider initiatives such as retrofit incentives to remove obstacles that could otherwise prevent well-intentioned landlords and developers from being able to consider retrofit as a potential route to net zero.”



Energy-Efficient Economy (ACEEE) indicate that comprehensive retrofits of commercial buildings can enable up to 40 per cent energy savings compared to single-measure improvements.

Local authorities across the UAE are spearheading retrofit programmes to enhance the energy performance of some existing building stocks. Dubai leads the way and has completed retrofitting of more than a thousand buildings and 7,000 villas.

According to Dubai Electricity and Water Authority (Dewa), its project of retrofitting 30,000 buildings across the emirate can help unlock savings of over \$22bn.

Dewa further reports the project will help Dubai eliminate nearly one million tonnes of carbon dioxide emissions, and reduce consumption of more than 5.6 billion imperial gallons of water and 1.7 terawatt hours (TWh) of electricity by 2030.

#### **Building a business case**

A government representative from Ras al-Khaimah said as awareness of retrofit

options increases, it is important to ensure the process is accessible to a wider section of the property market and not just larger players.

“Governments must consider initiatives such as retrofit incentives to remove obstacles that could otherwise prevent well-intentioned landlords and developers from being able to consider retrofit as a potential route to net zero,” he said.

Also critical is greater clarity on financial regulations and minimum standards.

“A strong and transparent business case supported by measurement and validation is also needed to see how benefits are realised over the whole life of the building. Only then will we see if retrofit is the optimum low-carbon, net-zero focused solution,” said the representative.

Retrofitting efforts are apparent in the UAE, but there are no mandates that stipulate necessary upgrades of older buildings. This is seen as an issue to be overcome before retrofitting can become a natural progression in a building’s lifecycle.

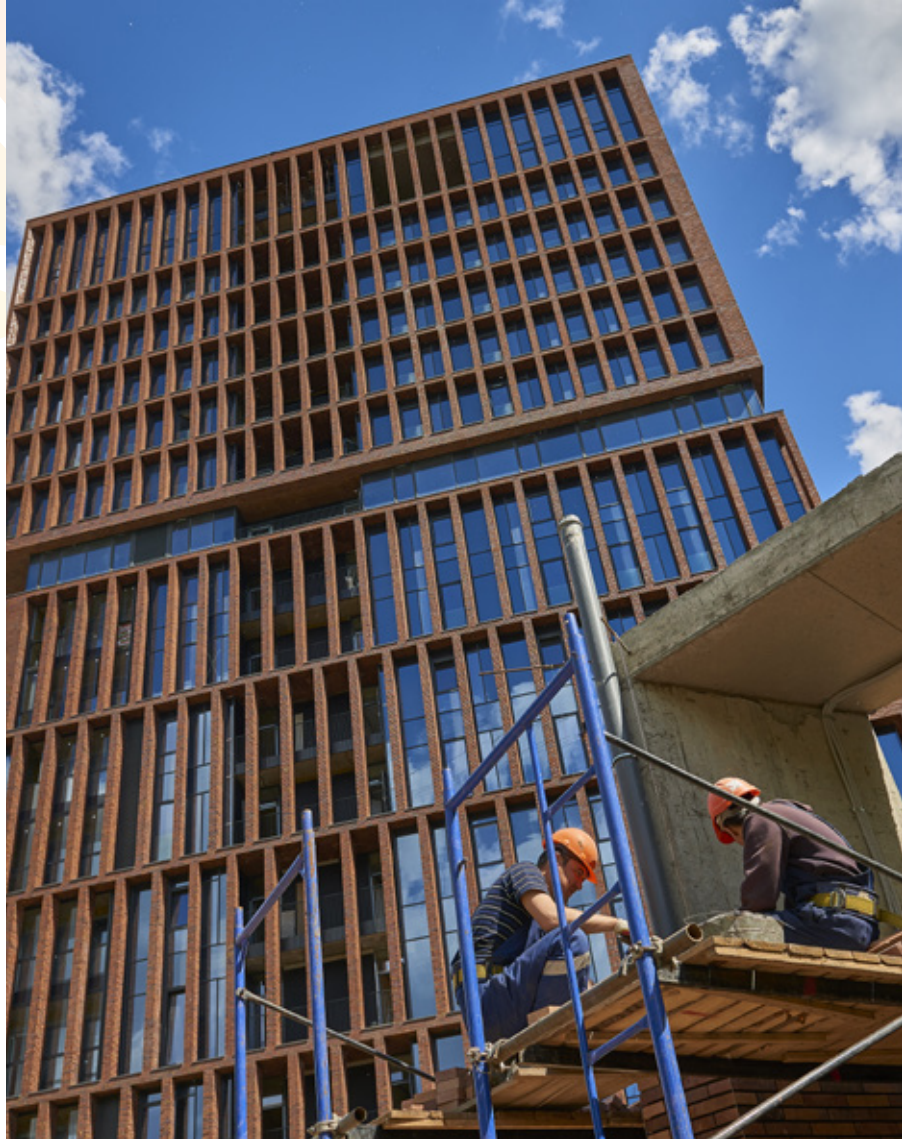
## LESSONS IN RETROFIT



Retrofit is a major component of Europe's net-zero strategy. WGBC's pilot Build Upon project brought together 2,000 organisations across 13 countries to design a framework for renovating existing buildings as a means of reducing emissions.

The collaboration included governments and local authorities, construction companies, product manufacturers, energy providers and banks – and its success led to the launch in 2020 of Build Upon2 to give cities across Europe the tools to achieve net-zero carbon status by 2050.

**“Large-scale data centres can't really be located in the city due to their size and the rents within urban hubs.”**



### Community benefit

A Dubai Municipality representative at the club said that the region's construction industry has been accustomed to tackling huge projects and may take time to come to terms fully with the change in scale that retrofit brings.

“As more people end up living longer in the city, they will hopefully be more inclined to invest in their homes,” he said.

“For this reason, it is important to recognise the importance of smaller niche retrofit projects to regularise opportunities so that everyone in the community can benefit.

This opens a new market within contracting where smaller firms can assist people to retrofit their homes with new technologies that will help them make their own contribution to reducing carbon emissions.”

The materials used in construction also influence the decision to retrofit. An engineering consultant in the room said

that while buildings have become much more energy efficient, significant amounts of energy are still required – and therefore large amounts of carbon are emitted both during the manufacture of components as well as in the construction phase.

This has added more weight to the argument that retrofitting existing structures to increase their energy efficiency may be a sensible way to assess the impact of embodied carbon released during the build, operation, and demolition of structures.

“However, mandating carbon assessments is only the first step in a long and difficult journey to realising a substantive reduction in a building's overall carbon footprint,” said the engineering consultant. “The need for low carbon construction materials, at commercially sensible prices, is an obvious and considerable hurdle to reducing the overall carbon footprint of the construction industry.”

# Adopting new ways of working

Construction must reassess the way it delivers projects to play a more active role in the UAE's journey to net zero by 2050



**C**onstruction stakeholders in the UAE and around the world are facing growing pressure to keep their carbon footprint in check.

Globally, the buildings and construction sector is estimated to account for nearly 40 per cent of annual carbon emissions, and the industry is increasingly recognising that it must act now to reduce its long-term environmental impact.

While the task at hand is monumental, industry experts gathered at the Construction Business Leaders Club's note that opportunities for change are more viable than they seem.

From adopting paperless strategies and incorporating cleaner building materials, through to tapping into the hydrogen economy, the construction industry could potentially readapt many of its conventional practices in the near-term.

The need to reconsider deep-set

practices is essential given the enormity of the challenge.

"Carbon neutrality is no longer the goal but just a starting point, a way to offset our actions," said an engineering consultant, part of the panel discussion at the club. "We now need to actively think about net zero, which is top of the agenda for regional and global governments."

The projects industry needs to define specific changes, said the consultant. It also needs to take charge for its actions, going above and beyond client briefs when it comes to managing carbon footprints.

## **Effective partnerships**

Experts at the club regard public-private partnership (PPP) projects as an effective route to drive green outcomes.

"Where in the past PPP in markets such as the UK carried a stigma and were seen as a way to generate profits for the private



# \$10bn

of green hydrogen and green ammonia projects in the UAE

Source:  
MEED Projects

**A hydrogen economy affects not just energy – it’s been around for a long-time, especially with industrial processes and has always been created locally as a byproduct.”**

sector, it is now regarded as a way for funders to expand their green portfolio,” said the engineering consultant.

He expects to see lenders and investors prioritise investments into projects with greater green outcomes. As PPP projects grow in number and relevance, they could steer the cause for environmentally conscious infrastructure.

“We see almost a triple push now – from the government, lenders and service providers - to deliver green projects,” said the consultant.

### Hydrogen

Hydrogen is quickly becoming a priority for governments in the region as part of their efforts to transition to net zero. The creation of a hydrogen economy would have a positive knock-on effect on the construction industry.

In the UAE alone, more than \$10bn of green hydrogen and green ammonia projects have been identified by MEED Projects, constituting 11 per cent of the value of all hydrogen projects identified in the Mena region.

But beyond serving as a new market opportunity for contractors, hydrogen also provides an alternative to conventional fuels used in the industry.

“A hydrogen economy affects not just energy – it’s been around for a long-time, especially with industrial processes and has always been created locally as a by-product,” said an attendee at the club.

And while hydrogen-fuelled electricity generation is yet to match the level of maturity of conventional thermal power solutions, experts say that progress is just round the corner.

“We’re scaling up our expertise in terms of distribution and storage quite rapidly,” said the engineering consultant.

For example, pilot hydrogen combustion generators are being trialed in Europe to power construction sites, while the use of innovative technologies such as drones and AI are reducing project development time thereby cutting overall emissions.

### Building materials

Cement and steel are two of the most widely used materials in construction, and are both notorious for their carbon footprint. Their production accounts for 7-10 per cent of global carbon emissions each.

Emissions from steel manufacturing, however, are nearly double the quantity of steel produced – for every tonne of steel

produced, 1.85 tonnes of carbon dioxide is emitted, creating an unsustainable system.

As cities expand to support urban population growth, demand for these materials is only set to rise. It has become crucial to find alternatives to both the production processes and the materials themselves.

Recent years have seen efforts to bring sustainable building materials to the market. But adoption in the region has been limited, due to a lack of expertise, cost, and in many cases a hesitancy towards change.

“As an industry, we need to recognise and take responsibility for embodied carbon every time we create a structure,” said the engineering consultant. “These structures need to be future-proofed.

“We also need to help authorities come to terms with how we can approve structures made of green cement or steel. It’s not the regulator’s responsibility alone – we have to push for it, and this will require not just courage but also huge amounts of investment.”

Modularisation is an area that has seen steady demand in recent years, as source providers move closer to deployment sites, reducing transport time and cost.

“The Middle East’s construction sector is also almost on par with global standards when it comes to design – which now means that change can actually take place, as long as there is a will,” said a management consultant at the club.

Efforts are also underway when it comes to research, development, and pilot projects.

At COP 26, the UAE committed itself to the Industrial Deep Decarbonisation Initiative (IDDI), working with nations including India, Canada and Germany, as well as relevant organisations, to tackle carbon-intensive construction materials.

Similarly, Heriot-Watt University Dubai’s Centre of Excellence in Smart Construction is leading research efforts locally to derive ways to decarbonise cement.

With support from the UAE Ministry of Climate Change & Environment, the centre is working with industry players to find practical solutions for the production of cement with a far lower carbon footprint.

“Ultimately the investors, particularly from the private sector, are getting far fussier about what they invest in,” said the consultant.

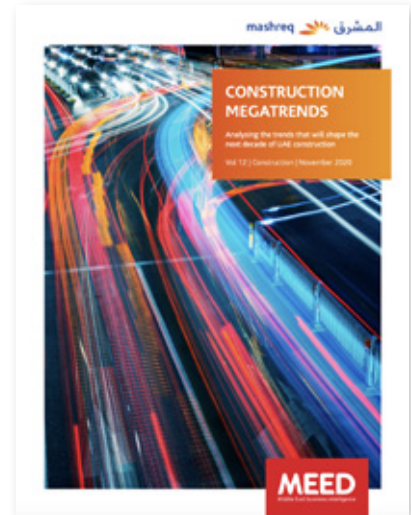
“This will drive the design team to come up with more environmentally sustainable solutions. The solutions are out there. They just require investment.”

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Today, Mashreq has a significant presence in 11 countries outside the UAE, with 21 overseas branches and offices across Europe, the US, Asia and Africa. Mashreq launched its new Vision and Mission recently, outlining its commitment towards its clients, colleagues and the community.

In line with its vision to be the region's most progressive bank, Mashreq leverages its leadership position in the banking industry to enable innovative possibilities and solutions for its customers across corporate, retail, international, treasury and Islamic banking.

Mashreq is proud to be the first financial institution in the UAE to be awarded the Gallup Great Workplace Award for four consecutive years from 2014-17. Mashreq also continues to invest in recruiting, training and developing future generations of UAE national bankers.



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