Deloitte.

13th edition

The transition to sustainable capital projects

Deloitte GCC Powers of Construction 2024

MAKING AN IMPACT THAT MATTERS since 1845

Foreword

Welcome to the 13th edition of the Deloitte GCC Powers of Construction. This publication serves as a valuable resource offering insights into the state of the construction industry across the markets in a region where construction spend is significant and the need to shift from traditional practices to a more sustainable construction ecosystem is pressing. This publication also looks at how efficiencies can be achieved across these projects, some of which relate to better data integration and hence transparency over the life cycle of the asset, from design to operational management of these assets.

The construction industry is exploring the changes required to make more use of technology across the stakeholder landscape, which should translate into better decision making throughout the design and build phase as well as avoid unnecessary changes which result in wasted money and resources. The industry needs to continue to invest in technology that allows all stakeholders to integrate all the data and increase the use of data to optimize the management of capital assets.

Incorporating data throughout the lifecycle of capital assets has the potential to greatly enhance preventive and predictive maintenance during the operational phase, as a wealth of information gathered during the build phase, such as mechanical, electrical and plumbing (MEP) warranties, precise build drawings, and layouts, can be smoothly transferred to the owners. This proactive approach not only extends the lifespan of the asset but also ensures a better experience for end-users by maintaining optimal performance levels and improve financial management of these assets.

One of the key challenges in the construction industry has been the fragmentation of data across different phases of a project. From design and build to operations and maintenance, data is often siloed, making it difficult to access and use effectively. Integrating data across the entire lifecycle of a capital asset and having a single source of truth that provides comprehensive insights into the asset's performance - from the initial design phase through to its long-term maintenance - will allow for better financial forecasting and analysis, giving stakeholders a clearer understanding of the costs associated with maintaining the asset over time as well as the benefits of investing in sustainable options at the design and build phase. Another insight that could be achieved from this includes an analysis of the longer-term savings this may have on the overall operation of the asset for the end users and the environment.

In our current business landscape, the use of technology is critical, and the wealth of data collected through a project's lifecycle is invaluable. To date, the use of data spans from digital credentialing to 3D printing, drones, virtual reality and BIM, technologies that help make construction work more efficient, accurate and safe when used consistently. If this were integrated with the budgets and the actual costs and scheduling of the project as well, it would allow for the application of predictive analytics. This would entail using the data to determine most likely scenarios, predict when materials are needed, rolling forward and computing impact of forecast costs and mitigations that could prevent overruns. Other potential predictive AI could identify issues around the job site and make recommendations for avoiding them. Predictive analytics and machine learning can also improve safety around the job site and create better schedules for workers. By fully integrating data across the lifecycle of capital assets, the construction industry can unlock new opportunities to improve both operational efficiencies, reduce waste and improve financial outcomes for all stakeholders and drive the industry to be more efficient and collaborative.

This edition of the GCC Powers of Construction delves into the current market conditions and trends, drawing from data and insights shared by industry leaders and leveraging Deloitte's expertise, and includes a series of articles that reflect the industry's collective movement towards driving sustainable economic growth, fostering sound business practices, and optimizing the use of available data to ensure efficient and sustainable asset management over their lifecycles.

We hope this year's publication will provide you with a deeper understanding of the challenges and opportunities that lie ahead for the construction industry as we seek to propel the industry into the effective use of data to drive a more sustainable construction pathway.

by **Cynthia Corby** | Partner and Regional Construction Industry Leader | Deloitte Middle East

> "In our current business landscape, the use of technology is critical, and the wealth of data collected through a project's lifecycle is invaluable."

Contents

Unveiling insights from one of the largest infrastructure asset projects in the region

A conversation with His Excellency Khalifa Al Zaffin, Executive Chairman of Dubai Aviation City Corporation and Dubai South

Al Maktoum International Airport

Given the exciting announcement about the commencement of construction for the World's Largest International Airport, Al Maktoum International Airport (AMIA), I had the privilege of interviewing the Executive Chairman of the Group that owns Dubai's airports, His Excellency Khalifa Al Zaffin.

The announcement made on Sunday April 28, 2024, outlined the Dhs128 billion project will be five times the size of the existing Dubai International Airport when it is completed. The existing airport site in Dubai South, also known as Dubai World Central, which is where AMIA will be located, serves a small fraction of the planned 260 million passengers that AMIA will eventually have capacity for and which is a significant increase from a record 90 million passengers who flew through Dubai international Airport (DXB) for the year to December 2023.

The airport will be at the center of the 140 square kilometer project know as Dubai South. There are five clustered zones that include the Dubai Logistics City, Commercial City, Residential City, Aviation City and the Golf City. It will host the world's leading companies in the logistics and air transport sectors, which will bring a whole host of new jobs to Dubai and a significant increase in activities has already commenced following this announcement.

There will be more than 400 aircraft gates, and five parallel runways with the highest operational specifications. The airport will span 70 square kilometers once fully complete.

It will also see all operations currently at Dubai International Airport eventually move over to Al Maktoum International Airport in the coming years.

His Highness Sheikh Ahmed bin Saeed Al Maktoum, president of the Dubai Civil Aviation Authority, CEO and founder of the Emirates Group and chairman of Dubai Aviation City Cooperation (DACC), said in the announcement in April that the first phase of the project will be ready within 10 years and will accommodate 150 million passengers annually.

Set out below are the questions I posed to His Excellency for us to understand more around the scale of this project and the process and plans to make this a reality.

Question 1. In your role as the Executive Chairman of the Parent Company owning one of the largest infrastructure asset projects in the region can you walk me through the key factors that were considered when assessing the feasibility of the new airport project, and how were these factors prioritized?

A: The aviation sector is a key pillar in Dubai's vision to be a vital player in the world's future, and our growth to date, including our recovery since the pandemic, has set the trajectory for the future growth.

At DXB we are limited by a certain level of capacity, and it is the forecast growth levels together with our continuous desire to improve the level of service experienced by our customers that were the key drivers for the new airport concept.

The airport megaproject, including the surrounding Dubai South masterplan, will allow for continuous development for generations to come and is reflective of the foresight and ambition of Dubai, which will ultimately become the aviation capital of the world.

Question 2. What if any best practice principles were applied in this process from lessons learnt in the past when preparing for such a large scale infrastructure investment?

A: There are a number of key elements which are being considered, some of which form part of our learning experience from DXB, and some of which have evolved due to the size and scale of the AMIA project, and the Dubai Finance guidelines around PPP funding.

Aside from the sustainability goals, a key element of our ultimate design is a modular, multiphased approach, which will be aligned to anticipated passenger growth and increasing passenger demands. This will ensure that we are nimble, efficient and are always able to incorporate the latest technology as well as meeting increasing passenger demands. We are prioritizing life cycle costing in all of our feasibility and capex planning to ensure a longer-term view of the required investment is taken.

From a passenger experience perspective, the new airport will be revolutionary, with state-of-the-art technologies deployed for eliminating congestion and facilitating unhindered airport operations. These will include an advanced traffic curbside management system, an uninterrupted automated people mover system (APM), and intuitive way-finding technology throughout the concourses and terminals, which will all seamlessly carry travelers to their gate.

Planning an abundance of retail, food and beverage, relaxation and entertainment offerings will ensure that passengers not only have a great experience, but that we also maximize the revenues generated across the airport real estate, and our planned return on investment which was a key factor of our feasibility study.

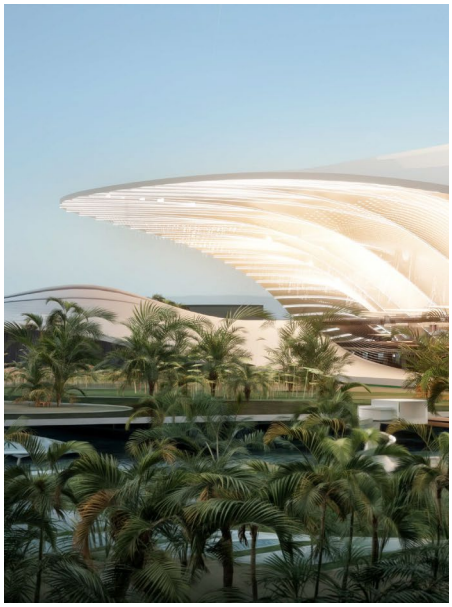
Question 3. Can you describe the approach that has been adopted when assessing best ways to fund the project in the context of the Dubai government's PPP law and if this has been considered at all in your project?

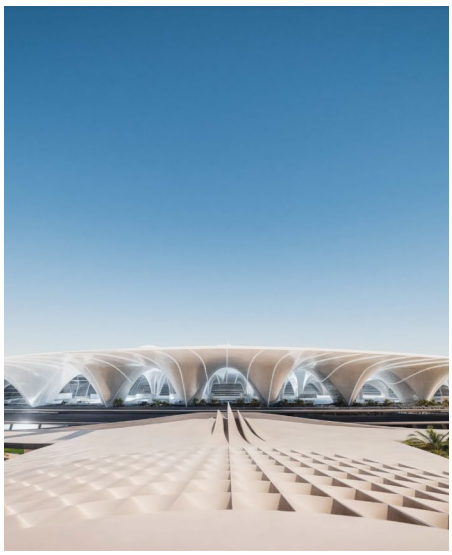
A: Dubai's strategic vision; to drive sustainable economic growth; will, amongst other things, be achieved through fostering productive partnerships between the public and private sectors.

We are very fortunate to be supported by the Dubai Finance PPP team, who have issued comprehensive guidance on how to approach PPP projects and ensure that we create the ideal conditions for private sector companies who have the necessary capabilities to contribute to Dubai's future.

We consider the PPP law, and the Dubai Finance detailed guidelines in every project that is assessed - from the initial screening stage, all the way through to contract inception. We ensure that detailed feasibility studies, together with robust financial models are prepared as well as carrying out the necessary technical and legal analysis. This allows us to provide a sound basis to monitor the performance of our investments against these financial models and planned outcomes.

Question 4. What would you describe as the key success factors for consideration of PPP





funding given you recently announced transaction with Empower on the aviation district cooling assets?

A: Through our partnership with Empower, the DACC Group has, and will continue to benefit from Empower's industrial leadership, innovative technologies and quality of expertise, which is fully aligned with our ambition to deliver streamlined operations at DXB.

I would consider the critical success factors here to be (1) that we are supported by a strong technical partner, and (2) that the relationship is held together with a clear framework agreement which has been well thought through with adequately and fairly allocated risks. Striking this balance, ensures that there is a mutual benefit for all parties and is critical for the success of a long-term partnership.

Question 5. What would you say are the most important elements of a successful large-scale capital programme, and how will these elements be incorporated into the construction of the new airport project and how will all key stakeholders monitor and measure these elements?

A: There are a number of key elements which lead to successful program delivery, and without alignment of all of them, capital projects, especially the larger ones, can go off track very quickly.

The DACC Group have deep experience in delivering large-scale projects; evident from the delivery of the existing terminals and concourses at DXB. We have found that the following are the most important elements:

1. Having a clear vision, project scope and definition which is endorsed by leadership.
2. Having a first-rate engineering and project management team.
3. Having good governance and transparency from the start, which importantly includes all stakeholders to ensure we achieve an optimum outcome for all.

DACC benefit from the continuous support from His Highness Sheikh Mohammed bin Rashid Al Maktoum and our Group Chairman; Shiekh Ahmed bin Saeed Al Maktoum who have a clear and unwavering vision for Dubai's aviation industry. It is through this leadership that visions become reality.

DAEP, led by H.E. Suzanne Al Anani, continuously raises the bar in terms of value engineering, risk identification and project management. Across the Group, we ensure that there is rigorous communication, reporting and internal accountability for project Goals, which will be continually monitored as the project develops.

Dubai Airports, Emirates Airlines and Fly Dubai are also heavily involved in the design to ensure we deliver the differentiated experience that their passengers have become accustomed to. This collaborative approach ensures we all collectively deliver on the vision of Dubai.

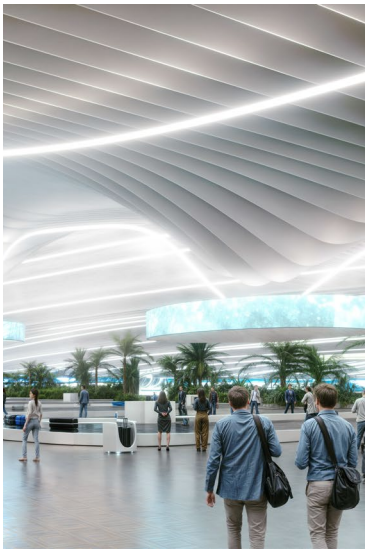
Question 6. How will the investment on the new airport project be monitored and evaluated to ensure that it is meeting its objectives, both in terms of financial outcomes and other economic and key performance indicators given the importance of the aviation industry to Dubai's economy?

A: Supported by the Dubai Finance, together with collaboration across the DACC Group, we have developed a long-term financial roadmap which sets out all of the potential different business models in the new airport environment. This covers all elements of capital expenditure, revenues and operational costs, and this will be the key tool against which we monitor the future performance and investment.

Question 7. What are some of the potential risks and challenges associated with the new airport project, and how will these be mitigated?

A: This is a huge project and we are working towards a set timetable. Amongst other things, this project brings risks such as delays, schedule disruptions, cost overruns, and construction capacity in the industry.

DAEP have unrivalled experience in delivering huge scale complex projects, and they have consistently managed to deliver on time and at superb quality and we expect nothing less this time. Supported by very clear governance around PPP guidelines together with clear financial models against which the CAPEX budgets will be monitored, also helps to significantly mitigate the risk profile.



Question 8. How do you see a project of this size and scale driving positive economic impact in the Dubai market for the supply chain and all associated industries, and the broader real estate that surrounds the airport, specifically Dubai South which also falls under your responsibility as Executive Chairman of Dubai South?

A: Al Maktoum will be five times the size of the current Dubai International Airport, and will ultimately reach a capacity of 260 million passengers per annum.

Given the size of the project, the development period alone will have a huge impact on the level of activity around the Dubai South area, in terms of the sourcing of construction materials, the required labor force and related government visas and permits. This will impact all sectors of construction from planning, core infrastructure and specialized technology providers and all associated businesses including SMEs.

The aerotropolis will generate an estimated workforce and residential requirement for over a million people living and working in Dubai South. Moreover, the strategically placed logistics district seamlessly connects AMIA to the Jebel Ali seaport and will be home to the world's leading companies in the logistics and aviation sector.

We expect the new airport to completely transform the geographical makeup of the Emirate, and Dubai South will be at the heart of this.

Question 9. How do you envisage embracing new technology throughout the construction phase and also in the operations of a new state of the art airport?

A: The new airport will allow us to really embrace innovation and completely reinvent the passenger journey and experience, with connectivity and accessibility being prioritized. It will provide cutting-edge technologies, unrivalled levels of passenger experience with state-of-the-art aviation support facilities.

We continue to see an exponential growth in technology together with a greater focus on mitigating environmental emissions and we are embracing an integrated approach. This will ensure that we are able to redefine the standards of excellence for our passengers whilst aligning with the UAE's vision for a sustainably built environment.

Question 10. How has sustainability been considered as part of the design and the operation of the new airport and how will this be measured in terms of success factors and areas for continuous improvement?

A: The new AMIA airport will be a showcase of global innovation in relation to airport technology and sustainability. We are targeting the LEED Gold for sustainability and this target is the foundation for all of our planning, procurement and design. The airport terminal and concourses will rely on clean energy sources such as photovoltaic solar panels and will be enveloped by solar glazing to control energy inputs. We are working closely with Dubai Municipality to enable a zero waste to landfill recycling strategy and the improved technology is expected to cut water consumption by about 70%.

Question 11. What do you define as success in 10 years' time when the airport is ready to open its doors in 2034?

A: In 10 years' time we will have successfully achieved the vision as announced by His Highness Sheikh Mohammed bin Rashid Al Maktoum in 2024.

We will have developed the largest airport in the world, the passengers will have the highest level of experience, and we will have solidified the place of Dubai on the map of importance in not only aviation and travel, but in technology and sustainability.

Interviewed by **Cynthia Corby**
Partner I Regional Construction Leader
Deloitte Middle East

The GCC projects market outlook

The GCC projects market broke all records in 2023 as spending reached new levels. But with this performance comes challenges that sustainable construction can overcome.

After a challenging few years, the GCC projects market upended even the most optimistic expectations in 2023 by breaking all spending records. With $224.9bn-worth of contracts awarded, the figure was just over double the 2022 number and 30% higher than the previous peak set in 2014, according to the MEED Projects database.

This eye-opening number was driven by a rare convergence of record expenditure across both the oil and gas and construction sectors, which combined to see spending reach levels few could have anticipated just a year earlier.

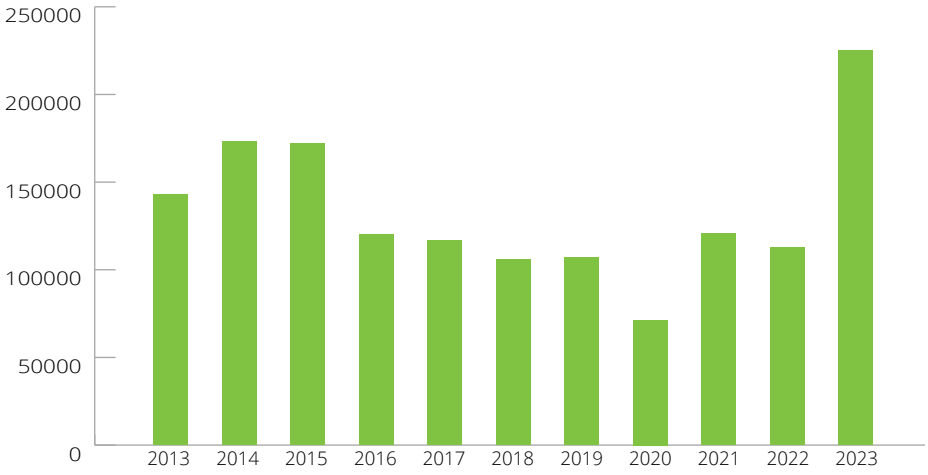
Saudi Arabia and the UAE were the chief catalysts for this growth. The former posted an all-time high of $101.3bn-worth of project awards, beating its previous best of $59bn set in 2022.

Any analysis of the projects market today cannot ignore the impact of Saudi Arabia's gigaproject programme. And for good reason. With a total value of about $880bn, according to MEED estimates, it is one of the world's largest and most ambitious capital project investment drives.

To date, just over $90bn-worth of contracts have been awarded on the programme, which consists of five official gigaprojects – Neom, Qiddiya, Diriyah, Red Sea Global and Roshn – plus other Public Investment Fund (PIF) project companies such as New Murabba, Jeddah Central and Rua Al Madinah, as well as government entities including Riyadh Sports Boulevard and King Salman Park Foundation.

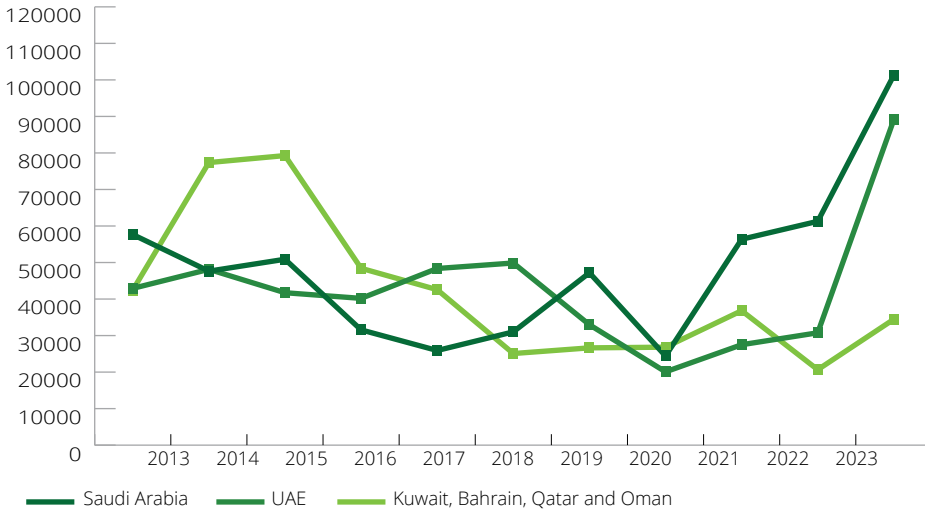
Yet while Saudi Arabia is gaining the most attention, the UAE almost tripled year-on-year contract awards to achieve its best performance of $89.1bn, a total underpinned by record spending in the Abu Dhabi hydrocarbons market. There was also a resurgence in Dubai's real estate sector, led by strong demand for new property, resulting in a raft of project launches and activity levels not seen in more than a decade.

Value of GCC project contract awards, 2013-2023 ($m)



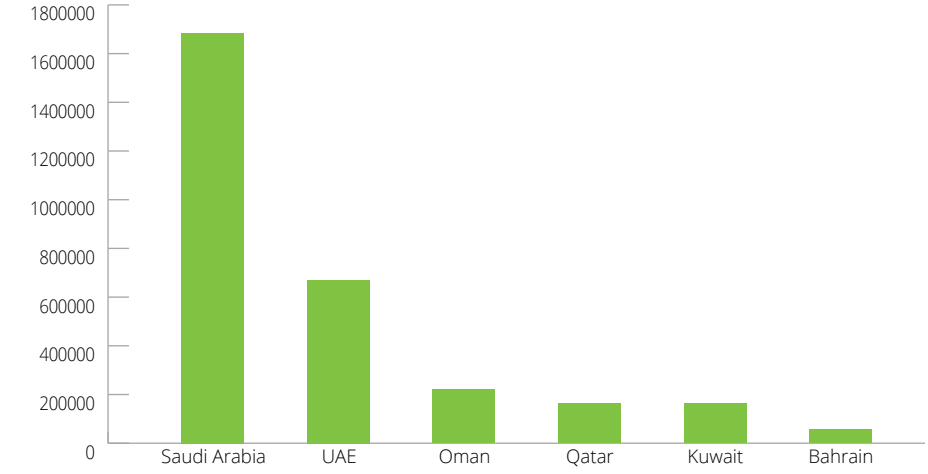
Source: MEED Projects

Value of GCC contracts awarded by country, 2013-23 ($m)



Source: MEED Projects

Value of planned and unawarded GCC projects ($m)



Source: MEED Projects

As development expenditure accelerates, the scale of the delivery challenge also grows.

One of the chief concerns is cost. Higher interest rates, rising demand and logistical issues have resulted in rapid rises in imported building material prices, which in turn have led to substantial cost inflation. For a programme worth hundreds of billions of dollars, this equates to heavy impacts on spending budgets.

Logically, it then follows that projects must evaluate their scope and phasing to accommodate more stretched budgets. The engineering complexity of some schemes adds to this cost challenge as design consultants and contractors account for the enhanced construction risk.

Finding sufficient labour to handle the increased workload is another major issue. MEED estimates the Kingdom will need 1.5 million to 2 million additional labourers, skilled technicians and engineers. These workers will also need to be housed, fed and transported, which is no easy task when accommodation and logistics resources are already under pressure.

Just as significant is the huge material demand required to complete each gigaproject.

To highlight the size of this challenge, just one of the gigaprojects alone – Roshn – estimates it requires at least 40 million cubic metres of concrete, 4 million wooden doors and 80 million square metres of porcelain tiles. Another, Rua Al Madinah, says it needs 5.25 million metres of electric cable, 26,000 windows and 845 13.8kV substations. Diriyah Company anticipates it will require 1.2 million tonnes of rebar, 140,000 AC units and 50,000 bathrooms.

> “As development expenditure accelerates, the scale of the delivery challenge also grows.”

But perhaps the greatest challenge of all is how to deliver projects sustainably.

All gigaproject clients, other major regional real estate developers and national oil companies have committed to low-carbon or even zero-carbon developments.

To achieve this, they must consider three main separate, but ultimately integrated, phases: planning and design; construction; and post-completion asset management and operation.

Fortunately, the implementation of sustainable construction technology and processes also resolves many of the other pressing issues.

For example, the use of public-private-partnerships (PPPs) to finance, build and operate renewable power, desalination, district cooling and water treatment requirements not only ensures carbon-free utilities service provision, but also removes some of the upfront capital costs by spreading them over the lifetime of the PPP concession.

Similarly, the increasing deployment of modular and offsite fabrication technologies reduces the need for on-site labour and, by extension, accommodation and logistical pressures. It also has the added benefit of accelerating fast-track delivery at lower cost.

Software technologies such as building information modelling (BIM) will have a potentially major impact on sustainable development. Combined with smart construction deployment such as solar-power site generators, hydrogen-cell labour transport, and more efficient tools and plant equipment, the efficient implementation of the right technology can result in a more sustainable project design and construction.

The incorporation of digital twin and machine learning technology during the planning stage will also improve the predictive maintenance of assets once completed and ensure they operate with the greatest environmental efficiency.

By involving all key stakeholders throughout the project development cycle, construction risk will be reduced, in theory resulting in lower overall building costs.

Sustainable finance is another fast-emerging trend. Green bonds, sukuk and loans link funding with measurable sustainable project metrics ensuring they adhere to their sustainability objectives.

The PIF announced in October 2022 and February 2023 that it had issued six green bonds, raising $10bn to help fund its eligible projects. Last year in the UAE, DP World and Aldar, among others, announced sukuk issuances of $1.5bn and $500m, respectively, in part to finance sustainable measures in their existing assets and future projects.

The sustainable financing model is expected to generate increasing traction as the market matures. Given the size of the project pipeline in the region, estimated by MEED at $2.96tn, adding more debt-raising options will help bridge the funding gap in a more environmentally conscious manner.

Sustainable construction is now at the heart of almost every conversation on project development. By embracing it, project stakeholders can not only meet their ESG objectives, but also benefit from the distinct cost and delivery advantages it can bring.

> “Sustainable construction is now at the heart of almost every conversation on project development.”

by **Ed James** | Head of Content and Research | MEED GlobalData Plc

Building the sustainable cities of the future

As the world's population continues to grow, the need for sustainable and liveable cities is more important than ever. Building sustainable cities of the future is not only crucial for the environment but also for the well-being and quality of life of city dwellers. The construction industry has a vital role to play in this endeavor.

There are many considerations to making a city more sustainable. Of course, one of the biggest problems is the carbon footprint, with cities accounting for around 75% of emissions globally[1]. But they also produce an incredible amount of waste (cities produce 10 billion tonnes of waste every year)[2]; they contribute to land and biodiversity loss (urban areas have grown at an average of 2% every year from 1990 to 2020)[3]; and they are a major source of water wastage (in the US, it is estimated that 6 billion gallons of treated water are lost each day)[4]. And then there are the social and economic challenges of those that live in cities (whether income inequality, lack of affordable housing, social or racial segregation, or isolation and loneliness). Cities are a critical component to any effort to build more sustainable global systems.

The construction industry has a critical role to play in making cities more sustainable. The choices that stakeholders in the construction industry make in the design, build, operation, renovation, and demolition of infrastructure can all have a major impact on sustainability. There are a number of considerations businesses should keep in mind when weighing their options on future projects.

> "The construction industry has a critical role to play in making cities more sustainable."

Designing for sustainability

The very first step is for companies to consider ways that the design of buildings can facilitate more sustainable outcomes. There are many aspects to consider. For example, a building's utilities systems.

Buildings should be designed to minimize energy consumption by optimizing building orientation, maximizing natural daylighting, improving insulation, using energy-efficient HVAC systems, and integrating renewable energy sources such as solar panels. They can also focus on water efficiency, integrating rainwater harvesting systems, greywater recycling, and drought-resistant landscaping to reduce water consumption and minimize strain on municipal water supplies.

There are also city planning and human use considerations during the design phase. City infrastructure should be designed in a way that encourages sustainable behaviors by the city's residents. It should be designed to maximize the use of sustainable transport; to make it easy and convenient to recycle and compost; to enhance green space or adopt systems to reduce urban heat islands; or otherwise adopt biomimicry principles to improve energy or water systems.

It also means building in resilience and adaptability in the design phase. This involves adopting features such as designing for disassembly, which facilitates the dismantlement of buildings, potentially reducing greenhouse gas emissions by 10% to 50%. Promoting this circular design means having a good understanding of the lifecycle GHGH footprint of the assets and the potential areas for saving during construction, operation and disposal, implementing globally recognized design and standards, identifying potential re-use purposes such as transitions of assets to other uses and ensuring longevity through robust maintenance and operational processes. This could also mean implementing urban mining principles that account for the second life of assets. Such adaptability will make the infrastructure more climate resilient over the longer term.

Developers should think about how to incorporate smart technologies that make maintenance and prevention easier, to extend the lifetime of infrastructure components, such as utilizing AI and generative design technologies to track and evaluate potential decarbonization scenarios and the potential emissions generated by their activities.

Irrespective of the specific interventions, any project must engage with local communities and stakeholders to ensure it suits the needs of the local population, today and in the future, to avoid the need for changes or wasted resources.

Building for sustainability

Of course, the actual build and construction of infrastructure projects can be made more sustainable in various ways. Transitioning to more sustainable materials, such as green concrete or green steel, would greatly diminish the carbon emissions associated with the construction phase. Adoption of these new materials is gaining traction, supported by growing numbers of private equity and venture capital funds focused on sustainable investment.

The challenge with these solutions at the moment is scale. While many solutions exist, they don't yet have the widespread adoption that will lead to economies of scale and lower costs. There are two key ways to help solve this.

First, it will be important for leaders in the industry to drive adoption. This entails raising awareness, creating collaborations and partnerships, building demonstration projects, and advocating for more progressive regulation and innovation.

Second, developers and construction companies should also prioritize sustainable procurement throughout their own supply chain. By working with partners (both upstream suppliers and downstream users) to identify sustainable solutions, and prioritizing those that sign up for these initiatives, market leaders can multiply their impact on adjacent industries. In addition, reskilling the workforce becomes crucial at this stage. Training programs need to be enhanced to equip workers with the necessary skills for deploying new technologies and sustainable construction methods effectively.

Operating for sustainability

The next step in sustainable transformation of the industry is to think about how to create more value from, and extend, the lifecycle of infrastructure assets. Shifting to models that prioritize reconstruction or restoration will help avoid the emissions from new construction activities and the use of virgin materials.

For example, the industry could offer 'Building as a Service (BaaS)', where owners of infrastructure pay a regular fee for ongoing maintenance or renovation services. This model ensures a steady revenue stream for construction companies while encouraging them to think about both the longevity of their infrastructure, and how to build for easier renovation over time.

Companies could also adopt 'pay-for-performance' financing, where clients pay based on the achieved performance improvements, such as energy savings, indoor air quality enhancements, or carbon footprint reductions. This model aligns the interests of construction companies with those of building owners by incentivizing the delivery of sustainable renovation solutions.

In the transition to new business models, city governments also have a key role to play to push adoption by the construction industry. For example, they could adopt performance or outcome-based contracts, where developers, designers and contractors are incentivized based on the energy efficiency, sustainability, and longevity of the refurbished building. Adaptive reuse ventures could be created, where construction companies acquire underutilized or abandoned buildings and repurpose them for new uses such as residential, commercial, or cultural spaces. This would also support other aspects of a city's sustainability agenda, such as rehabilitating neighbourhoods or providing economic opportunities in local communities.

City governments could also look into shared ownership models, where construction companies partner with investors or community organizations to renovate buildings collectively. This model spreads the financial risk and incentivizes stakeholders to prioritize sustainable renovation practices to maximize long-term returns.

Decommissioning assets sustainably

Finally, managing the end of life of infrastructure assets is also an important opportunity area. The construction and demolition of buildings generate significant amounts of waste. Implementing responsible waste management practices can help reduce the environmental impact of the construction and real estate industry.

There are a number of ways that companies can improve in this area. First, more careful deconstruction, waste segregation, or selective demolition will allow for easier and more comprehensive recycling programs, as cross-contamination of materials makes recycling much more difficult. This will also allow for more effective reclamation and reuse, potentially even reusing some of the materials in the same project, such as through on-site crushing or grinding so concrete or asphalt can be reconstituted for reuse.

The challenges of building more sustainable cities are substantial. But by adopting sustainable practices both in their projects and operations, real estate and construction companies can lead the way in building the sustainable cities of the future while also reducing their environmental impact and promoting social responsibility.

Source:

1. https://www.unep.org/explore-topics/resource-efficiency/what-we-do/cities/cities-and-climate-change#:~:text=Estimates%20suggest%20that%20cities%20are,levels%2C%20can%20success%20be%20achieved
2. https://www.unep.org/news-and-stories/press-release/mounting-problem-worlds-cities-produce-10-billion-tonnes-waste-each#:~:text=Chemicals%20%26%20pollution%20action-,The%20Mounting%20Problem%3A%20World's%20Cities%20Produce%20up%20to%2010%20Billion,Each%20Year%2C%20UN%20Study%20Estimates
3. https://news.un.org/en/story/2023/07/1138682
4. https://infrastructurereportcard.org/cat-item/drinking-water-infrastructure/

by **Laura Jepson** | Partner | Sustainability and Climate Consulting Lead | Deloitte Middle East

Daniel Gribbin | Director | Sustainability and Climate Lead | Deloitte Middle East

> "The next step in sustainable transformation of the industry is to think about how to create more value from, and extend, the lifecycle of infrastructure assets."

Sustainable capital projects: Influencing design and construction

The Gulf Cooperation Council (GCC) has experienced remarkable transformation in recent decades, emerging as a hub of economic growth and development. Despite facing challenges such as the global pandemic, the region has regained momentum, with a renewed focus on advancing the built environment. This resurgence and increased demand for capital projects across various sectors and underscores the importance of integrating sustainability agendas to align with national and international commitments.

The hosting of COP28 in the region underscores the commitment to addressing environmental challenges and promoting sustainable practices as a global leader. As the GCC continues to drive its development agenda forward, ensuring sustainable and environmentally conscious approaches throughout the delivery of capital projects will be central to achieving success and creating a lasting impact.

Across the capital project delivery value chain, two focal points emerge that urgently require attention: **design** and **construction**.

Addressing these areas will play pivotal roles in shaping the sustainability outcomes of capital projects. Understanding and optimizing these aspects are crucial for organizations and governments aiming to align their initiatives with global sustainability goals and ensure the longevity and resilience of their built environments.

Understanding the regional landscape

Analysis indicates that the record spend in 2023 has been propelled by significant project awards spanning various sectors, including construction and infrastructure[1]. This surge can be attributed to several key factors, including higher oil prices, Saudi Arabia's Vision 2030, a revival of the Dubai real estate market, and the green light for long-awaited gas and petrochemicals initiatives.

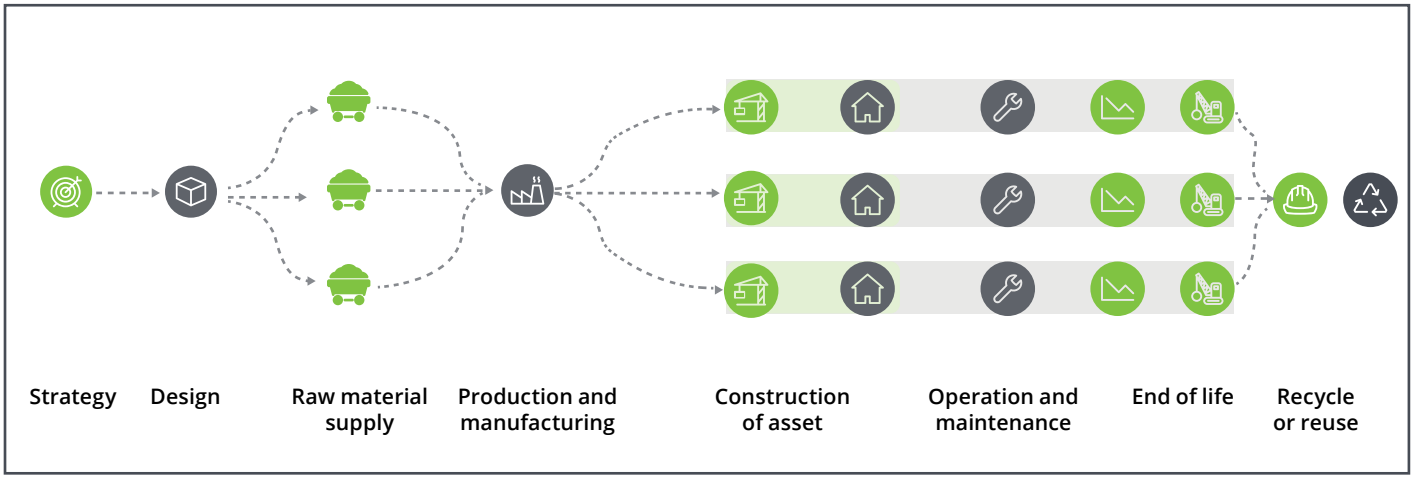
While the market welcomes the increase in expenditure, this shift has led to questions regarding the capacity and capabilities to successfully deliver projects in the regional pipeline. Add to that an environmental lens, and delivering infrastructure projects becomes increasingly complex.

Recognizing the importance of integrating sustainability into every phase of these projects is crucial for meeting sustainability Key Performance Indicators (KPIs) and other targets. Integrating sustainability principles throughout the lifecycle of capital projects can yield multiple benefits[1]. Firstly, the incorporation of sustainable design and construction practices can lead to the reduction in greenhouse gas emissions, optimize resource utilization, and enhance energy efficiency. Secondly, sustainable infrastructure can enhance social outcomes by prioritizing community engagement, accessibility, and resilience.

There is a growing focus on advancing sustainability through various initiatives. One notable trend is the expedited use of connected construction, modularization, and digital technologies aimed at addressing long-term costs while promoting an ecosystem approach to development. Efforts also focus on scaling up the use of low-carbon materials like 'green' steel and cement, aligning with global goals to reduce carbon emissions.

The region is also making strides in adopting electrified equipment as a primary step, with plans to transition to hydrogen-powered machinery in the near future, contributing to overall decarbonization efforts.

> "Recognizing the importance of integrating sustainability into every phase of these projects is crucial for meeting sustainability Key Performance Indicators."



Progress is being made to increase capacity and access to green energy sources. In parallel, there is an emphasis on integrating biodiversity into construction programs through collaboration with civil society partners to safeguard local habitats and manage drainage systems effectively.

Realizing the transformative potential of sustainable capital projects requires collaborative efforts among a diverse range of stakeholders across the value chain. This collaboration can ensure that projects are effectively planned, executed, and monitored to achieve their sustainability goals. Additionally, it enables these projects to make a significant impact on the broader sustainability agenda at national and global levels.

Key challenges

- A major challenge faced by the construction industry today is the complex process of integrating sustainable features into traditional practices, starting from the design phase. Designers may view such tasks as the responsibilities of the environmental consultants rather than part and parcel of their design tasks. This highlights the need to eliminate fragmentation and reinforces the need to implement enhanced collaboration across the value chain.
- Adopting best practices and ensuring consistent regulations and codes of conduct are fundamental to setting expectations. The recent progress in this regard reflects the capability in achieving this goal. The GCC Green rating systems and regulations have enabled significant growth in the last five years, driven by the region's net-zero visions.
- The Middle East industry is undergoing a transformation, recognising the potential of these systems to enhance profitability and return on investment. A study by the Global Green Growth Institute indicated that the current building regulations are the key factor determining the environmental impact of construction in the UAE.
- As a result of these regulations, residential projects such as The Signature Livings in Jumeirah Village are now powered by solar energy, and Abu Dhabi is set to have its first net-zero energy office building in Masdar City by 2024.
- In December 2022, the UAE Cabinet approved National Building Regulations and Standards to drive decarbonisation in construction, targeting a 25% reduction in energy consumption and a 16% decrease in water usage. Saudi Arabia introduced its tailored green-building rating system, Mostadam, in 2019, tailored to local climate and environmental characteristics. This has been well-received by major developers working on the giga-projects across the kingdom.
- Meanwhile, Qatar integrated its Global Sustainability Assessment System (GSAS) into national construction standards in 2010, making it mandatory for all private and public sector projects to obtain certification under this green-building rating system. By 2021, Qatar had over 1,400 GSAS-certified buildings, including all World Cup 2022 facilities
- While the evolution in expectations and requirements for designers has played a significant role in shaping the industry, more efforts are needed to standardize and develop benchmarking for future development.
- The costs associated with sustainable design and construction often deter many developers, despite the long-term environmental benefits and efficiencies in operational expenditure. The upfront investment in sustainable design and construction methodologies can significantly impact project budgets, presenting financial risks that may not be immediately offset by government subsidiaries or projected savings across the asset lifecycle. Quantity surveyors and main contractors face distinctive challenges when delivering sustainable buildings. Quantity surveyors must accurately estimate costs for sustainable materials and technologies, which often lack standardized pricing. The volatility in material costs, combined with the evolving nature of sustainable technologies, adds complexity to their role. Meanwhile, main contractors must coordinate various specialized subcontractors and ensure the seamless integration of sustainable features into the overall project plan. This complexity increases the risk of delays and coordination issues that may affect project timelines and budgets[2].
- Resource availability, access to sustainable materials, and the time-intensive nature of sustainable construction methods can lead to unforeseen challenges. Building sustainably often requires a level of technical expertise and skills that may not yet widely available in either developed or developing markets like the GCC. This can impact successful delivery and pose additional challenges.
- The adoption of advanced technologies in sustainable construction can be challenging. Many of these technologies are still in the earlier stages of development, leading to uncertainties regarding their effectiveness and reliability. Despite some success seen in utilizing Building Information Modelling (BIM) and Digital Twins as tools to promote integration, their implementation requires significant investment in training and adoption[3]. Furthermore, the construction industry traditionally has a slow rate of technology adoption, which can hinder the widespread use of these advanced technologies and costly to update when significant changes to track on projects, which is a characteristic of the region. So this too requires a cultural change.

In every challenge, there is an opportunity

To enhance sustainable practices and the adoption of innovative technologies in the delivery of capital projects, greater collaboration is essential among regulators, project developers, engineering firms, and contractors. This collaboration should focus on sharing knowledge, expertise, and resources to drive sustainable outcomes across the construction industry.

The construction industry is making strides towards sustainability, though there are still significant challenges to overcome. Collaboration, standardization, and innovation will be key in addressing these

challenges and moving towards a more sustainable future. This involves sharing best practices, lessons learned, and success stories to accelerate the industry's transition to greater levels of sustainable construction practices.

Technological advancements and innovation are crucial drivers of sustainable capital projects. Designers and contractors must actively contribute to the development of these technologies, utilizing existing tools and embracing new practices like AI and digital twins to enhance the sustainable delivery of projects[2].

The recent emphasis on renewable energy should be a consideration across the value chain, with significant impact achievable during the construction phase. This can be achieved through careful energy deployment, embracing energy storage solutions, and contributing to smart grid systems. Integrating renewable energy sources into the construction phase can reduce reliance on non-renewable sources and promote more sustainable practices within the industry.

Conclusion

The current state of research in Sustainable Design and Construction is often fragmented[3]. A more holistic approach is needed to fully grasp the intricate relationships between urban planning, building design, materials, and construction methodologies. This must extend through every phase of the building delivery process and across the value chain.

Source:

1. https://www.meed.com/gcc-projects-market-breaks-all-time-spending-record
2. https://giteximpact.com/2023/08/07/capital-projects-in-the-era-of-sustainability-a-global-infrastructural-shift/
3. Wong, N. H. Grand challenges in sustainable design and construction (2015) Front. Built Environ., Sec. Sustainable Design and Construction. Vol 1 – 2015 https://doi.org/10.3389/fbuil.2015.00022

by **Mark A. Smith**, Ph.D. l Partner | Infrastructure & Capital Projects l Deloitte Middle East

Moneeb Rafique l Senior manager l Infrastructure & Capital Projects l Deloitte Middle East

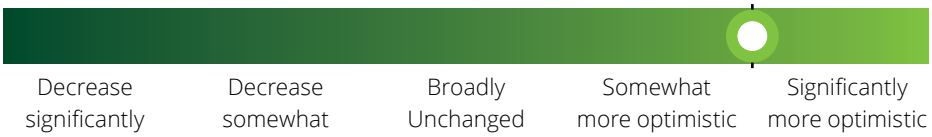
> "To enhance sustainable practices and the adoption of innovative technologies in the delivery of capital projects, greater collaboration is essential among regulators, project developers, engineering firms, and contractors."

Construction industry survey: The Chief Executives' view

Financial Prospects

85% of the respondents were optimistic over the next 12-24 months attributed to the external factors such as economy, competition and market trends etc.

Q. How do you feel about financial prospects for your company over the next 12-24 months?



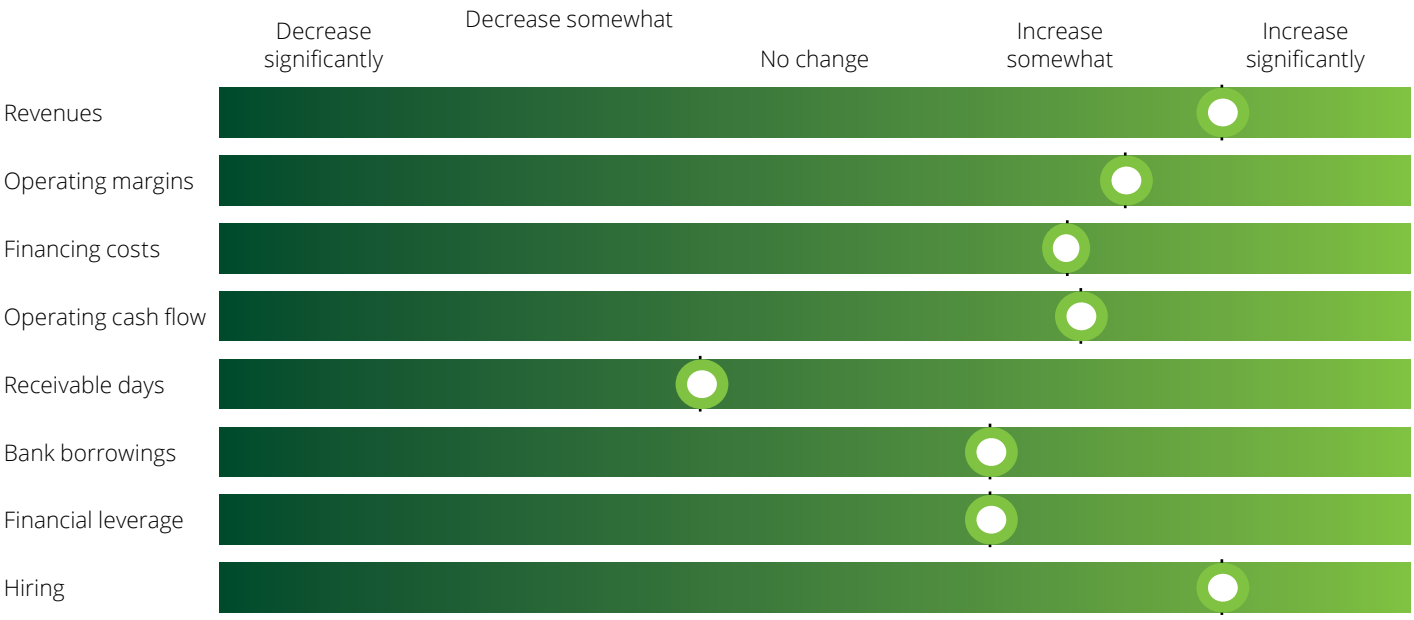
62%

of the respondents believe company's financial prospects driven mostly by external factors. (vis-à-vis 92% in 2022)

Financial & Operational Performance

While, positive outlook is expected to translate into increase in topline and operating margins, financing costs and operating cashflows are also expected to rise.

Q. What is your outlook for the following parameters?



Pricing / Tender Market Analysis

Most projects are being priced at annual target margin set by the company moving away from pricing with small margin while pricing bids with commercial margin remains prevalent. 54% of the respondents believe pricing of tenders has improved w.r.t margins and there is no difference between tender gross margin and realized gross margin, as compared to last year , where the pricing was more competitive and realized gross margin was less than tender gross margin.

Q. What pricing strategy have you adopted to win new bids ?

2023: 46%
2022: 38%

An annual targeted margin set by the group/ company

2023: 23%
2022: 38%

Risk with a commercial margin

2023: 23%
2022: 18%

Risk with a small margin

2023: 8%
2022: 6%

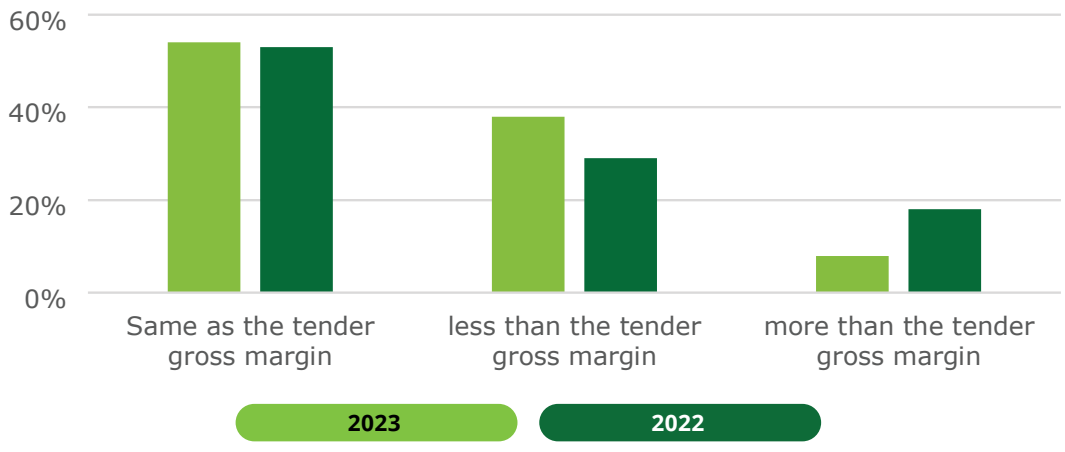
At break even with a view to make a margin on change orders

Q. Has pricing on tenders over the past 12 months?

Improved with respect to margins **54%**
2022: 47%

Become more competitive **46%**
2022: 53%

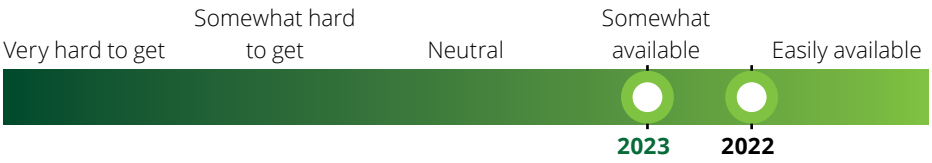
Q. Relative to average tender gross margin, the actual realized final project gross margin is:



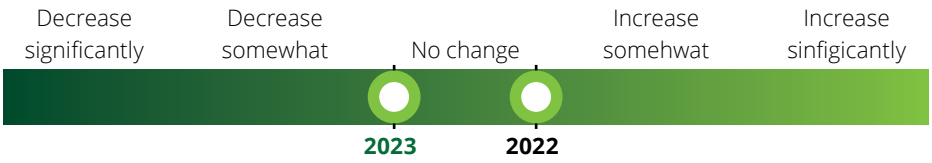
Funding

Increasing number of respondents include funding as a part of their initial project bids. As compared to last year, the availability of funding options are mostly at similar levels and respondents do not feel added pressure to finance contracts due to delays in payments. Nervousness around bonds being called are also lower than last year.

Q. Availability of financing to your Company:



Q. Level of nervousness around bonds being called compared to 12 months ago:



85%

of the respondents include some level of project funding costs (e.g. interest on bank over-drafts/ loans) their initial project bid . (vis-à-vis 71% in 2022)

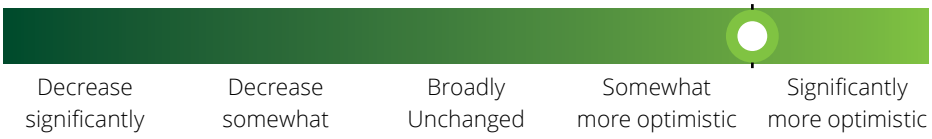
62%

of the respondents do not feel any greater pressure (relative to 12 months ago) to help fund projects due to delays in payments/other and only **38%** of the respondents feel the pressure (vis-à-vis 47% in 2022)

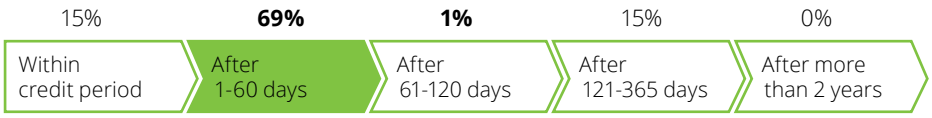
Contractual Disputes & Certified / Uncertified Receivables

WIP to cash cycle continues to decline and is currently at the lowest in 5 years. WIP to receivables witnessed substantial decline to 93 days as compared to last year (137 days) . While, 77% of the respondents do not include uncertified/ unapproved claims in the financial statements, most (42%) believe it is only expected to impact 2-5% of the bottom line.

Q. Initiating or completing contractual dispute resolution

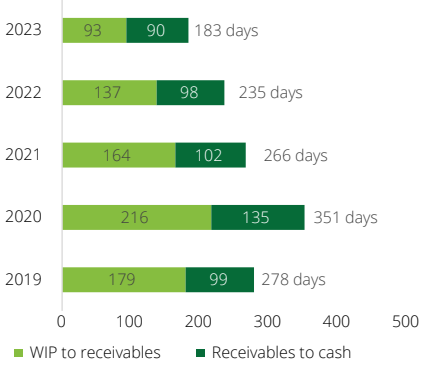


Q. Average number of days payments are received after revenue locked up in certified receivables

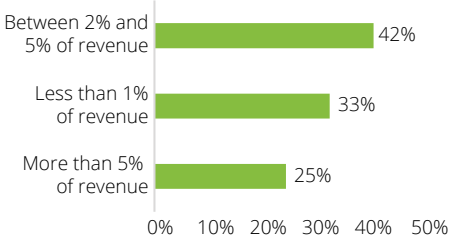


Q. Average number of days certification occurs after revenue locked up in uncertified WIP

77% of the respondents do not include uncertified/unapproved claims in contract revenue in their financial statements



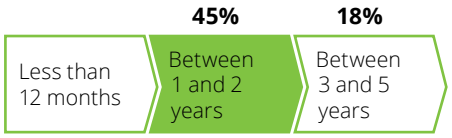
Q. How significant is the anticipated settlement of outstanding unapproved contract claims to your profit or loss?

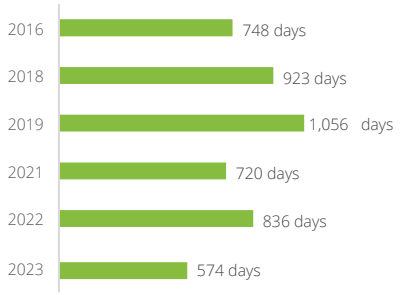


Contractual Dispute

There has been no substantial increase in the contractual dispute activity w.r.t value / volume as compared to last year however, average resolution days have decreased to 574 days vis-à-vis 836 days in 2022. In most cases, respondents believe that the outcome was less than requested / contractually owed unlike previous year where respondents felt the dispute resolution was fair or favored the contractor.

Q. Timeframe to finalize/resolve the dispute





Q. The final outcome of the dispute resolution was

Less than we requested and less than we feel we were contractually owed

2023: 54% | 2022: 47%

Fair to both the contract owner and the contractor or A good result for us as contractor

2023: 36% | 2022: 29%

50%

of the respondents (vis-à-vis **65% in 2022**) believe there is no change in contractual dispute activity over the past 18 months (either in terms of number of disputes or the value of those disputes)

77%

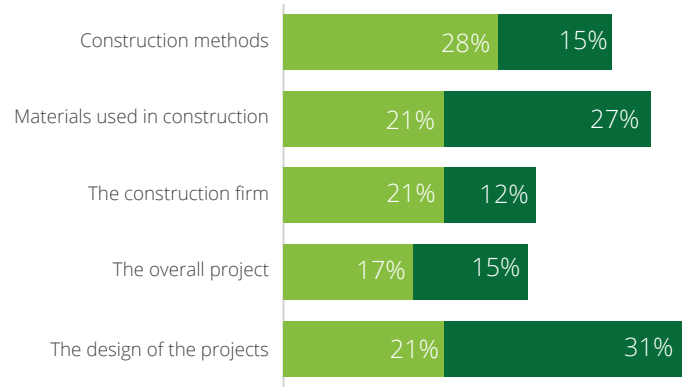
of the respondents' organization was currently involved in a contractual dispute (whether due to variation, claims, cancellation or other)

Sustainability

61% of the respondents (2022:53%) witnessed increasing interest in sustainability financing options and tenders incorporating sustainable elements. Unlike last year, where most green requirements were expected at the construction firm* (31%) and construction methods (28%) levels, the new tenders are diversifying to include more green elements such as construction methods (26%), materials used (20%), construction firm (19%) and project design (19%). Majority of the respondents (75%) viewed sustainability as a competitive advantage over a necessity and believe it needs to be regulated at an industry and country level to drive change.

Q. Is there an increase in interest in Green Bonds / Loans / Sustainability Linked Loans to finance projects?

Q. There is a greater proportion of tenders incorporating Sustainability/Green elements in the requirement?



*the construction firm is required to demonstrate it is itself sustainable / green

61%

of the respondents believe being a Sustainable/Green organization is an advantage and not an expectation in the market

85%

of the respondents think Sustainability & the construction industry should be driven by Regulations or the Market

83%

of the respondents think 'Green building' regulation is not enough in their country to drive forward change

by **Jaimi Raikundalia** | Partner, Audit & Assurance | Deloitte Middle East

Omar Shah | Senior Manager, Audit & Assurance | Deloitte Middle East

Building a safer future: Prioritising health and safety in the middle east construction industry

Unveiling the lay of the land

The construction industry in the Middle East has experienced rapid growth in recent years and plays a vital role in shaping the future of the Middle East. However, with this growth comes a critical need to prioritise Health and Safety (H&S) practices to protect the well-being of workers and the public. By focusing on H&S practices, we can ensure that this growth is sustainable, safe, and beneficial for everyone involved.

Navigating new regulations

New H&S regulations and codes have been rolled out across the Middle East. These provide clear guidance on the minimum standards necessary to ensure both the health, safety, and the well-being of the workers and the general public. Examples include the UAE's Fire and Life safety code of practice, Occupational Safety and Health regulations in the Kingdom of Saudi Arabia (KSA), Labour Law in Qatar, and the recent introduction of building codes by the Saudi Building Code National Committee in KSA.

Interpreting the data

Despite efforts to improve H&S practices, challenges such as the lack of awareness and training for workers, and the need for more stringent regulations remain. According to data from the General Organisation for Social Insurance (GOSI), the construction industry still accounts for approximately one-third of the occupational accidents in KSA. Although there has been an 8.2% reduction in occupational injuries nationwide during the first quarter of 2023, compared to the same period in 2022, there is still much work to be done.

Counting the costs

The cost of occupational accidents within the construction industry across the Middle East is also remarkably higher than the costs in USA, UK, Australia, and South America. For example, the total costs of an accident[1] in:

1. Oman is estimated at USD 415,620 with an economic burden of USD 205,73 million every year.
2. Qatari construction industry stands at USD 205,526.
3. Saudi Arabia is estimated at US$ 91,940, while the economic burden of the Saudi economy is estimated at US$ 261,11 million/year

The figures above highlight the need for better and enforced H&S practices and regulations across the region. However, it is important to recognise that these figures may not fully capture the indirect costs to an organisation, such as, reputational damage and negative publicity. These indirect costs can have a significant impact on the overall success and sustainability of a construction company, emphasising the importance of prioritising H&S in the workplace.

A call to action

When speaking with Marwa Dada, Health, Safety and Environment Lead, Deloitte Middle East, *"Ensuring health and safety in the construction industry is not just a legal obligation, but a moral responsibility towards the workers who are the backbone of the industry. All workers deserve to return home from work in the same condition they arrived, healthy and safe. In the Middle East, where the construction industry is rapidly growing, it is crucial for clients and contractors to work together, to prioritise the well-being of all workers to ensure sustainable development and progress."*

Anticipating future trends

Looking ahead, it is important to take note of the emerging trends and opportunities within the construction industry. Key players within the industry are investing in innovative technologies and processes to streamline H&S processes, and mitigate risk of occupational accident, injury, or illness. Examples include use of drones for site inspections, wearable devices that monitor workers' vital signs and the implementation of Building Information Modelling (BIM) to identify potential hazards and risks before construction begins, allowing for better planning and coordination of H&S measures.

While investing in innovative technologies is an undoubtedly strategic move for the future, it is equally imperative for construction companies to establish a robust H&S management system first. Neglecting this foundational step would end up causing more harm than good. This step includes equipping workers with the necessary knowledge and skills to identify and mitigate workplace hazards effectively. Unfortunately, a significant 69% of the construction companies in Dubai lack a comprehensive understanding of the importance of H&S[2]. This highlights the critical need for the construction industry to strengthen their H&S management system and drive educational campaigns to raise awareness before embracing technological advancements.

Another notable trend is the growing emphasis on mental health and well-being in the workplace. Studies have shown that almost 60% of construction workers experience a mental health issue at some point in their career. With increasing awareness of mental health issues, construction companies are recognizing the importance of providing support and resources to employees to promote their overall well-being.

> "Ensuring health and safety in the construction industry is not just a legal obligation, but a moral responsibility towards the workers who are the backbone of the industry."

By prioritising mental health in the workplace, companies can improve the health and well-being of their employees, enhance productivity, and reduce the risk of accidents and injuries.

With the rising demand for construction, it is crucial for construction companies to think proactively about how to implement a robust H&S management system. To guide the companies through this journey, we have put together a brief checklist, presented as a series of questions.

The questions in the checklist are intended to assist construction companies in identifying potential hazards and risks in their workplace, and support development of a comprehensive checklist, tailored to their individual operations, maturity and risk profile[3]. By answering these questions, companies can gain a better understanding of the H&S risks associated with their operations and identify areas where improvements can be made.

Conclusion

H&S is a shared responsibility, and collaboration is key. With the construction industry on the rise in the Middle East, clients and contractors must work together to create a safer working environment for everyone involved in, or impacted by the construction process. By improving current H&S practices, adhering to regulations, and ensuring adequate H&S control, construction companies can mitigate risk of accidents and incidents, and together, build a safer future for all.

- ☐ Are regular H&S risk assessments being conducted to identify potential hazards on our construction sites?
- ☐ Are all employees receiving comprehensive H&S training tailored to their roles?
- ☐ Have clear communication channels been established to address H&S concerns promptly?
- ☐ Are we strictly adhering to the latest H&S regulations to maintain legal compliance? Additionally, has a legal register been established to document all relevant H&S legislation with which we must comply?
- ☐ How are we promoting a safety-first culture within our organisation?
- ☐ Are we ensuring all machinery and equipment undergo regular maintenance to prevent accidents?
- ☐ Are employees provided with and properly using Personal Protective Equipment (PPE)?
- ☐ Have clear emergency procedures and protocols been established and communicated to all workers?
- ☐ Are safety committees in place to actively identify hazards and propose solutions?
- ☐ Are regular H&S audits conducted to assess and improve our H&S performance on construction sites?
- ☐ Is there documentation of corrective actions taken following audits and workplace inspections, and are they addressed promptly?

> “With the rising demand for construction, it is crucial for construction companies to think proactively about how to implement a robust H&S management system.”

Source:

1. Umar, T., 2020. The costs of accidents in Qatar, Oman, and Saudi Arabia construction industry. International Journal of Sustainable Real Estate and Construction Economics.
2. Witt, J., & Birt, A.: Managing Liability for Worksite Accidents. IOSH
3. It is important to note that this checklist is not intended to be comprehensive and may not identify all potential risks and areas for improvement. Therefore, it is recommended that organisations or business owners develop their own comprehensive checklist, tailored to their operations, maturity, and risk profile, using this checklist as a guide to support their efforts.

by **Daniel Gribbin** | Director | Sustainability and Climate Lead | Deloitte Middle East

Marwa Dada | Health, Safety and Environment Lead | Deloitte Middle East

For good measure: Assessing infrastructure's impact

Deloitte is in support of this initiative along with Duke University's Nicholas School of the Environment.

For good measure: assessing infrastructure's impact

On the surface, infrastructure is just a tapestry of roads, buildings, cables, and bridges that are used by citizens with little or no thought. But what if we can tweak and augment infrastructure so that it delivers more benefit to society, the environment, and the quality of life of citizens? This is the focus of the Economist Impact's Infrastructure for Good (IFG) initiative: developing infrastructure that addresses disparities, protects the environment, and creates widespread social and economic opportunity.

Infrastructure investment can have a transformative effect on economies and societies. And that's why Deloitte is currently supporting IFG—a ground-breaking research initiative that examines infrastructure ecosystems in 30 countries. IFG seeks to provide insights into how governments can use infrastructure to meet future challenges, featuring a first-of-its-kind barometer that helps assess risk, measure social and environmental impact, engage stakeholders, and facilitate regulatory compliance.

Why Infrastructure for Good? Why now?

We are at an important moment in history: over $5 trillion is projected to be spent on infrastructure each year over the next few decades. Coupling the scale of this spend with the "for good" approach allows us to imagine a world transformed. We now have the opportunity and the responsibility to act and build better societies for generations to come.

> "What if we can tweak infrastructure so that it delivers more benefits to society, the environment, and the quality of life of citizens?"

But we need to take action now. Consider the news in recent years. It was the hottest June on record in 2023[1] for much of Europe. Parts of Canada[2] and Chile[3] have experienced the worst wildfires the areas have ever seen. A cyclone[4] killed more than 500 people in southern Africa back in March 2023, one of the deadliest storms to hit the continent.

The Middle East is seeing its share of extreme weather events as well. Flooding in the UAE in April 2024 is expected to result in insurance claims of $850m[5]. And of course, in a region where summer temperatures regularly exceed 45 C, an increase in global temperatures can have widespread impacts on infrastructure and populations.

There is also a unique opportunity to embed IFG principles as the countries of this region embark on expansive economic diversification plans. In Saudi Arabia, there are 17 mega projects[6] announced or underway, with a total announced project value of almost $700 bn. Building these new developments in a way that incorporates IFG principles will help ensure they serve society long into the future. And in the UAE, which is embarking on its second Year of Sustainability, there is the opportunity to incorporate IFG principles to support and enhance wider efforts to make the UAE more sustainable.

With economies and events unpredictable at best and volatile at worst, it is critical to start as soon as possible to embed Infrastructure for Good principles at every stage of development—from design and selection to evaluation and construction.

Measurement is key

Management guru Peter Drucker once said, "what is measured is managed." Committing to IFG is one thing—but actually moving the needle requires a concerted effort and measuring that effort can be an important first step.

Enter the IFG Barometer. The barometer benchmarks the capacity of 30 countries to sustainably deliver efficient and quality infrastructure that addresses critical economic, social, and environmental needs. The data-driven framework offers a straightforward and powerful comparison that can be used to catalyze change, highlight gaps, and recognize progress. To put it simply, it provides a snapshot of what "infrastructure for good" looks like.

The barometer takes into account a wide range of inputs that can reveal where there are gaps in performance. The key pillars include Governance and Planning, Sustainable Financing and Investment, Social and Community Impact, Economic Benefits and Empowerment, and Environmental Sustainability and Resilience. These pillars not only provide a means of measurement but also provide a set of standards that can inform infrastructure development.

Currently, Saudi Arabia ranks 23rd in the IFG Barometer, with an overall score of 46.8 out of 100. Its performance is strongest in 'Sustainable financing and investment,' which is indicative of the long-term and comprehensive view the government takes to building its infrastructure across the country, serving communities in different cities and areas. The country also ranks well in 'Economic benefits and empowerment,' reflecting the focus of the government on using infrastructure investment as a means to diversify the economy, provide job opportunities, and enable local industry for economic growth.

One of the most challenging pillars for Saudi Arabia has been 'Environmental sustainability and resilience.' Luckily, we are starting to see this change; many of the mega projects have set themselves high standards for ensuring they minimize negative impacts and embed sustainability into their plans and approach.

Still, there needs to be greater investment in building up a wider understanding and a deep set of environmental management skills, which are lacking in the Kingdom today. This is especially crucial given the inherent risks of the country's climate. While it performs slightly better in our measurement of its infrastructure's resiliency to climate change, the extreme climate of the region creates a naturally higher risk which must be mitigated if its infrastructure is to withstand the worst effects of climate change.

Of course, the Barometer shows that no one government is perfect, and everyone has room to do better. IFG is all about raising standards and building awareness—with the barometer a vital benchmarking tool that governments can use to evaluate their progress.

Infrastructure for Good in practice

The Barometer can serve as a measure for projects to understand where they can approach their infrastructure projects more holistically. It is a guide for governments and the private sector to work together for the common good. Take NEOM, Saudi Arabia's largest mega-project which has one of the largest international public-private partnerships (ppp) for social infrastructure.

There is ample opportunity for IFG's insights to be applied in this part of the world and learn from the experience of other countries. For example, the Barometer shows that Switzerland is one of the only countries that requires consideration of nature-based construction options during the infrastructure planning approach. If this approach were to be adopted in the UAE or Saudi Arabia, it could help them design infrastructure that is more resilient to flooding, utilizing natural flood barriers to protect the built environment.

It will also be important for projects to take all steps possible to decarbonize, if the UAE and KSA are to meet their 2050 and 2060 net zero targets. Providing incentives for these projects to adopt better measurement and mitigation strategies would be hugely valuable. There are examples we can follow. For example, Australia's Emissions Reduction Fund[7] offers energy consumption, waste, and transport projects carbon credit units for every tonne of carbon dioxide equivalent emissions stored or avoided. Brazil[8] also has incentives to promote emissions-reduction technologies for infrastructure. Providing similar incentives in KSA or UAE would encourage a change in approach without threatening the viability of projects.

Another opportunity would be for countries here to put in place a disaster risk analysis in order to understand the climate-related risk of projects before they start. Only 7 of the countries in our Barometer currently have this requirement; adopting this approach would not just make us a global leader, but also ensure the projects being built today are ready for the challenges of tomorrow.

Infrastructure for Good going forward

Infrastructure has the power to make a difference. But this will only be delivered if the entirety of the infrastructure ecosystem works together—including public and private sectors, advisors, investors, construction, technology, developers, and stakeholders across all industries. It is up to all of us to take the principals of Infrastructure for Good into the future, to make a lasting impact.

Source:

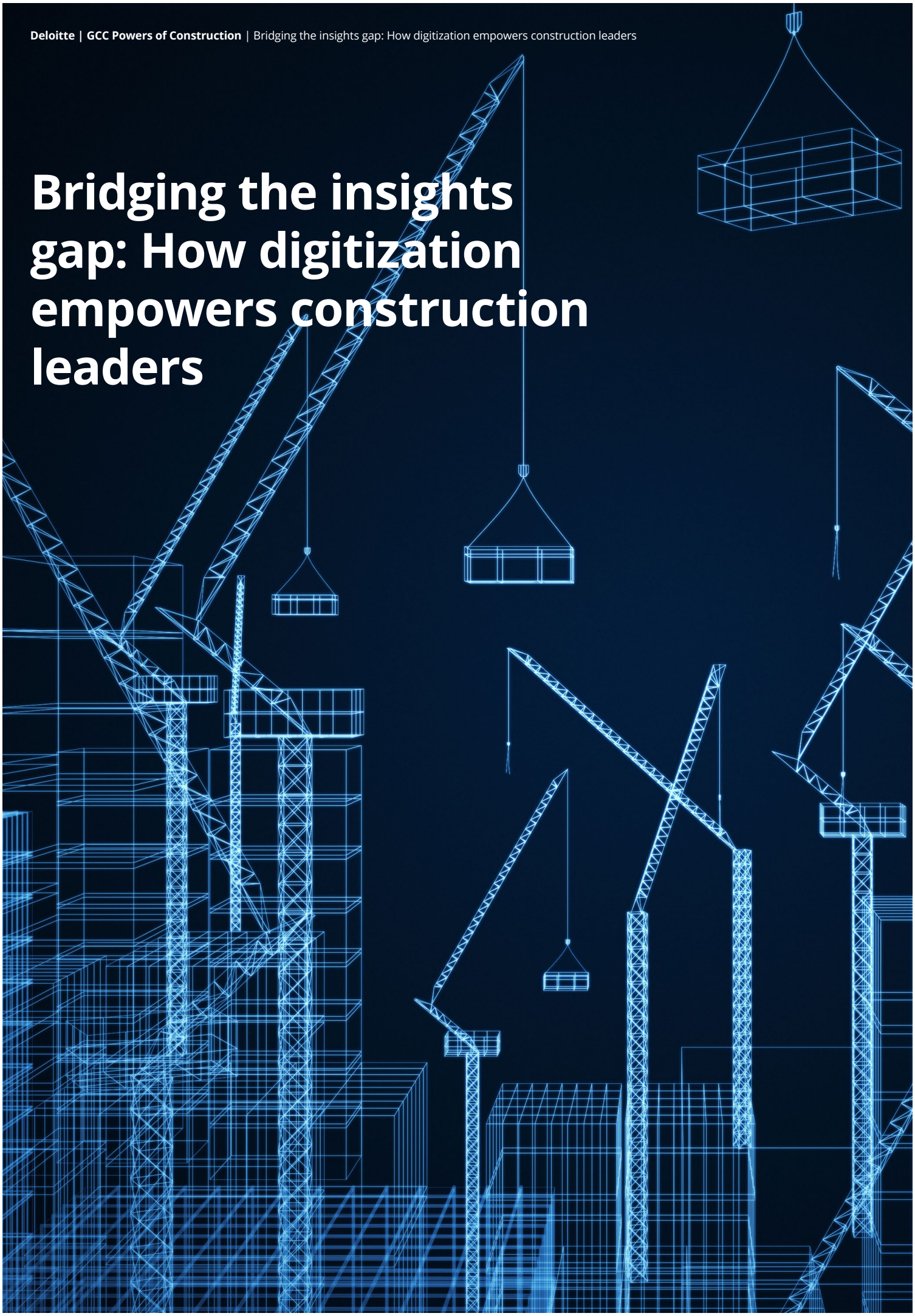
1. https://public.wmo.int/en/media/news/preliminary-data-shows-hottest-week-record-unprecedented-sea-surface-temperatures-and#:~:text=a media briefing.-,Hottest June,previous record of June 2019.
2. https://www.bbc.com/news/world-us-canada-66160243
3. https://www.reuters.com/business/environment/chilean-wildfires-spread-overnight-burning-up-hundreds-homes-2023-02-08/
4. https://www.reuters.com/business/environment/cyclone-freddy-among-africas-deadliest-storms-2023-03-15/
5. https://www.meinsurancereview.com/News/View-NewsLetter-Article?id=88050&Type=MiddleEast#:~:text=While preliminary estimated insured property,global risk and reinsurance specialist.
6. https://www.thenationalnews.com/business/economy/2024/02/03/saudi-arabia-megaprojects-17-developments-set-to-shape-the-kingdoms-future/
7. https://www.thenationalnews.com/business/economy/2024/02/03/saudi-arabia-megaprojects-17-developments-set-to-shape-the-kingdoms-future/
8. https://braziliannr.com/brazilian-environmental-legislation/law-no-13576-provides-for-the-brazilian-biofuel-policy-renovabio/

by **Michael Flynn** | Partner | Global Infrastructure, Transport & Regional Government Leader

Laura Jepson | Partner | Sustainability and Climate Consulting Lead | Deloitte Middle East

> "Requiring a climate-related risks analysis would help ensure the projects built today are ready for the challenges of tomorrow"

Bridging the insights gap: How digitization empowers construction leaders



The construction industry is facing a pivotal moment. Project complexity is escalating, while timelines remain tight. To overcome these challenges, industry leaders are recognizing the transformative power of data-driven insights for more agile and productive work.

It is widely accepted that the construction industry has not been the fastest with new technology adoption and for good reasons; even now the physical build is largely manual, and the documentation paper based. However, it has recently started to change. Recent years have witnessed a shift towards the digital tools as organizations started adopting systems for Building Information Modeling (BIM), scheduling, engineering, cost management and ERP. All that creates huge amounts of data, which unfortunately is left untapped.

The recent FMI's industry report shows that 96% of all data gathered in the engineering and construction world goes unused and only 8% of all the companies in this sector have "real-time, full project management information systems that allow for dashboard reporting".

Transformation starts with data and process

The data collection opportunity extends far beyond the millions of emails and documents exchanged on every project. Sensors can be deployed to measure temperature, sound, vibrations, and humidity. Data from wearables deployed across the workforce can also be used to monitor health and detect potential danger. It is particularly important as older workers are increasingly participating in the workforce in greater numbers (by 2026, 37 percent of those aged 65 to 69 years will be actively employed, versus 22 percent in 1996) and this will be no different for the Construction and Infrastructure industry.

Additionally, GPS-enabled wearables facilitate quick response and rescue efforts in cases of emergencies. It also provides an insight into worker movement patterns and site logistics, which can be used to optimize processes, where location data is involved. New layer of geospatial awareness can be added with drones - especially when capturing the information of places that are difficult to reach.

Drones help to create comprehensive, real-time view of the worksite, while capturing 3D views with high resolution and accuracy. This translates to enhanced safety and less overhead work. Previously, gathering and analyzing topographical, planning, and inspection data was a time-consuming process for site managers, contractors, and stakeholders.

Integration and automation

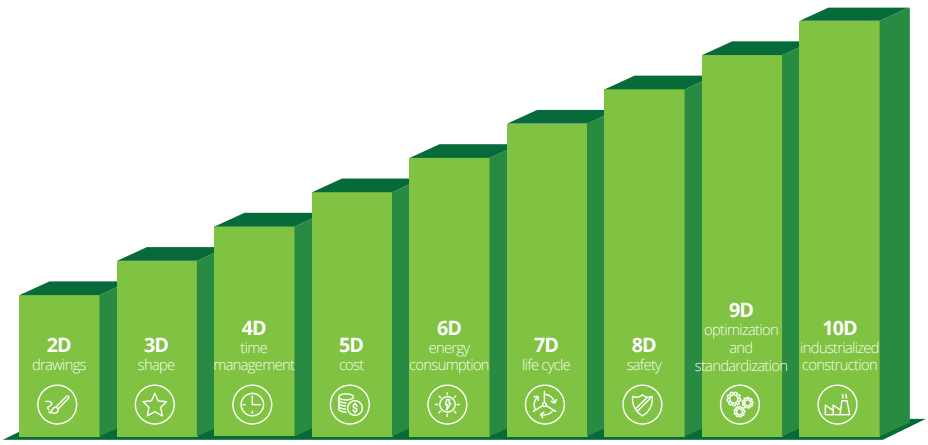
Setting up multiple data sources will not singlehandedly bridge the gap between siloed teams. This is where Building information modeling (BIM) paired with informative dashboards comes in by bringing together designers, engineers, architects, and contractors to collaborate on a coordinated project. BIM creates a virtual simulation of the construction so everyone can see how their work fits into a bigger picture and track construction progress visually. For instance, a dashboard might show the percentage of walls completed, the number of floors constructed, or the installation status of electrical systems.

BIM is more useful and impactful as more data gets integrated into the model. This way cost, changes and risk can be monitored from one interactive dashboard platform. Information from cost estimation software allows cost tracking against the baseline plan and facilitates identification of potential cost overruns early on. Sensor data can help to identify potential risks that could cause delays. A sudden spike in temperature or humidity presented on the dashboard might indicate a potential issue with material storage. The same applies to unstructured data, like emails containing approvals and revisions which can be mapped to the status of change orders, highlighting any delays in implementation.

BIM excels at forensic analysis, utilizing simulations to track potential failures, leaks, delays, and cost overruns (quantum issues) in near real-time. When delays occur, BIM can quantify their impact on schedules and associated costs. This empowers stakeholders to effectively communicate and justify claims related to delays and variations, a critical factor in resolving quantum issues.

> "96% of all data gathered in the engineering and construction world goes unused and only 8% of all the companies in this sector have "real-time, full project management information systems that allow for dashboard reporting."

BIM Dimensions



Additionally, "what-if" scenarios can be used to proactively address risks associated with unpredictable weather, material shortages, or design changes, minimizing their impact on project timelines.

A unified platform, based around the BIM data, ensures seamless collaboration, and eliminates potential clashes, as all stakeholders can view changes instantly. Access to the digital representation of the building facilitates faster information flow, improved simulations, and more efficient planning, ultimately leading to reduced project timelines and costs.

360 visibility and insights

Real-time analytics is the ultimate objective for data-driven industries, enabling proactive decision-making and eliminating outdated reports. However, context is equally important. Information needs to be presented at the right time and to the right people to avoid overwhelming decision-makers. Interactive dashboards built on a single source of truth address this challenge effectively.

Reliable data fuels meaningful and actionable insights across project portfolios, empowering fast and impactful decisions. Authorized users can access this data with just a few clicks, fostering data literacy. This increased transparency strengthens the business case for investment, ultimately improving throughput and reducing costs.

Implementing BIM and dashboarding isn't just about technology – it's a catalyst for broader organizational transformation, which converts existing processes using new technologies. For example: project status can be updated with a mobile app reducing the need for paper documents; risks can be monitored in the ongoing manner with interactive tools.

Successfully implementing new ways of working is 60 % people, 30 % data and only 10 % technology. Therefore, implementing digital tools has to be embedded into employees' routines, creating a sustainable approach that has longevity and continuity into future projects. Training, clear communication, and a focus on user experience are essential for fostering technology adoption. The transformation journey should be a company-wide cultural shift, where employees embrace technology as a powerful problem-solving and planning co-pilot.

This cultural transformation, coupled with enhanced business processes and a collaborative environment, empowers data-driven decision-making at all levels.

Are you ready to join the digital build?

The construction industry is embracing a digital revolution. No longer will mountains of data go unused. The modern approach is established on the principle of real-time insights on worker safety, project progress, and potential delays - all at construction leaders' fingertips.

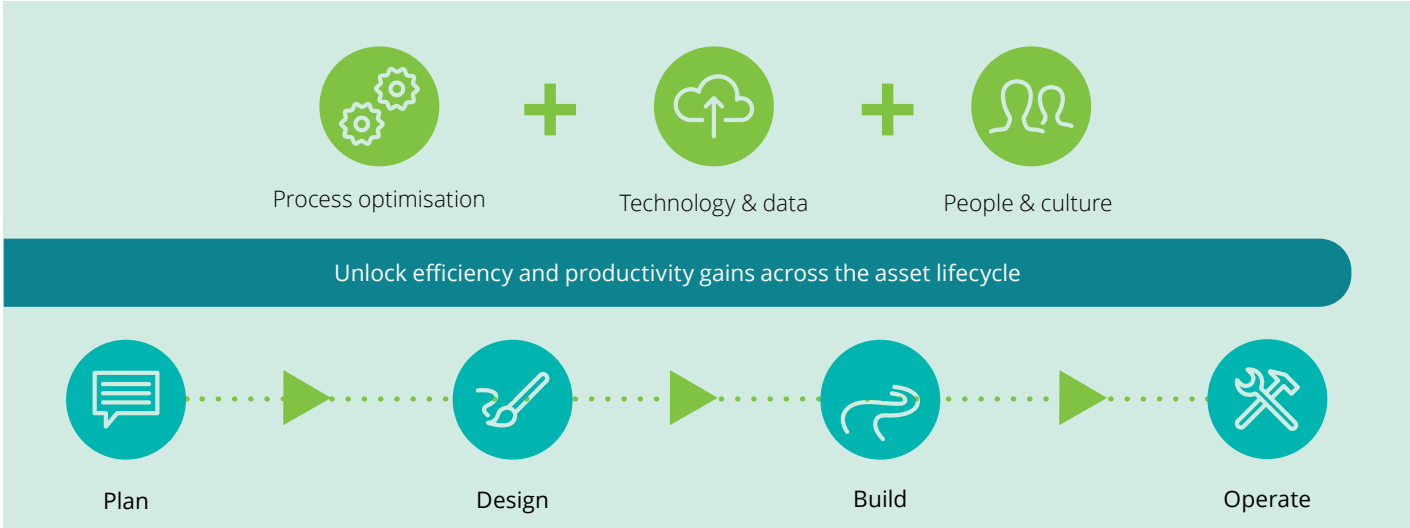
This isn't just about fancy visuals or theoretical models, it's about building smarter, faster, and more cost-effective construction processes by harnessing the power of data to navigate challenges before they become roadblocks. In this way technology becomes a trusted part of day to day of the physical build, guiding us towards a new era of efficiency.

"The modern approach is established on the principle of real-time insights on worker safety, project progress, and potential delays - all at construction leaders' fingertips."

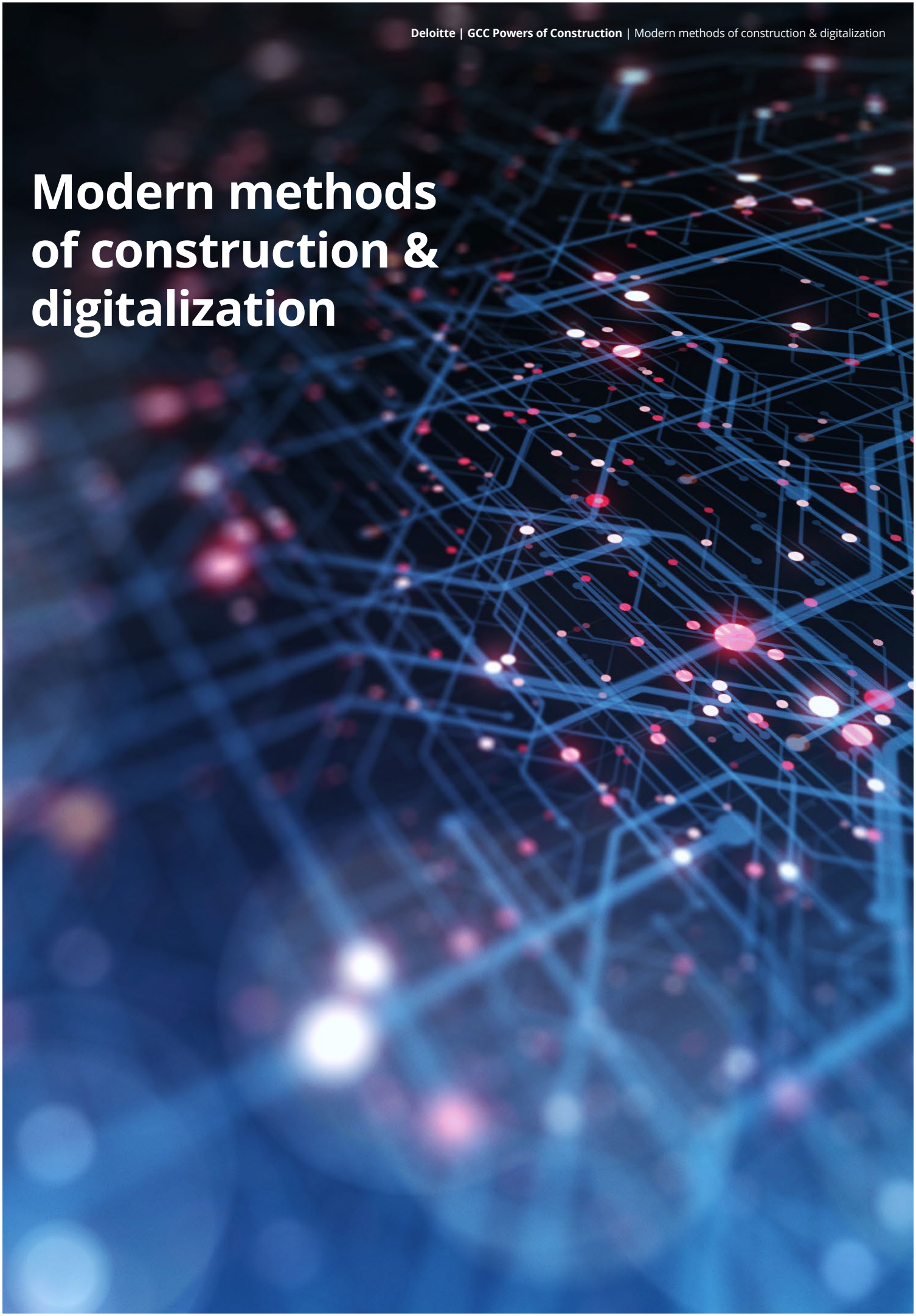
by **Christopher Clements** | Partner | Investigations & Disputes | Deloitte Middle East

Karol Kopanko | Assistant Director | Data & AI | Deloitte Middle East

Construction improvement levers



Modern methods of construction & digitalization



In the Middle East, the construction industry is undergoing a deep transformation driven by the adoption of Building Information Modeling (BIM) and Modern Methods of Construction (MMC). These innovative approaches are reshaping the landscape of construction practices, offering new opportunities to enhance sustainability, efficiency, and social equity in building projects across the region.

BIM, a digital process that involves creating and managing 3D models of buildings and infrastructure, has emerged as a powerful tool for improving collaboration, reducing errors, and optimizing construction workflows. Countries like the United Arab Emirates (UAE) and Saudi Arabia have embraced BIM as a standard practice, recognizing its potential to revolutionize the construction industry.

One of the key drivers behind the adoption of BIM is its ability to enhance project coordination and communication among stakeholders. By creating a centralized digital model that incorporates information about every aspect of a building or infrastructure project, BIM enables architects, engineers, contractors, and other parties to collaborate more effectively, anticipate potential conflicts, and resolve issues before they escalate. This not only improves the overall quality of construction but also helps minimize costly delays and rework, ultimately leading to faster project delivery and reduced costs.

In addition to BIM, MMC has emerged as a game-changer in the construction industry, offering new methods and techniques for building faster, smarter, and more sustainably. MMC encompasses a wide range of approaches, including modular construction, prefabrication, 3D printing, and off-site manufacturing, all of which are aimed at streamlining the construction process and improving the quality of built environments.

One of the most significant advantages of MMC is its potential to accelerate construction timelines. By prefabricating building components off-site in controlled factory conditions, construction projects can be completed much faster than traditional methods allow. This is particularly valuable in fast-growing urban areas like Dubai, where demand for new infrastructure and housing is constantly increasing. MMC also offers greater flexibility in design and customization, allowing architects and developers to create unique and innovative structures that meet the specific needs of their clients.

The prefabrication and off-site manufacturing of building components in controlled factory environments has numerous advantages, particularly in terms of worker safety, comfort, and job satisfaction. In factory settings, workers are shielded from the hazards and risks associated with on-site construction, such as extreme weather conditions, high noise and temperature levels, and potential accidents. This creates a safer and more secure working environment, reducing the likelihood of workplace injuries and illnesses.

Furthermore, MMC has significant implications for sustainability and environmental responsibility. By minimizing waste, reducing energy consumption, and optimizing material usage, MMC techniques can help mitigate the environmental impact of construction activities and enhance resilience to climate change. This is especially important in a region like the Middle East, where rapid urbanization and development have put strain on natural resources and ecosystems. By embracing MMC, countries in the region can take proactive steps towards building more sustainable and resilient communities for the future.

Moreover, MMC contributes to improving the social aspects of the ESG framework by addressing critical challenges related to housing affordability, quality, and accessibility. In many parts of the Middle East, rapid population growth and urbanization have led to significant housing shortages, particularly for low- and middle-income families. MMC offers a promising solution to this problem by enabling the rapid construction of affordable housing units using standardized building components and efficient construction methods.

By reducing construction timelines and costs, MMC techniques make homeownership more accessible to a broader segment of the population, thereby promoting social inclusivity and economic development. Additionally, the quality control measures inherent in MMC processes ensure that housing units meet stringent safety and quality standards, improving living conditions and enhancing the overall well-being of residents.

Despite the numerous benefits of BIM and MMC, the widespread adoption of these technologies still faces several challenges in the Middle East. One of the main obstacles is the need for skilled professionals who are trained in the use of BIM software and MMC techniques. While educational programs and training initiatives are helping to address this need, there is still a shortage of qualified personnel with hands-on experience in these areas. Additionally, there may be resistance to change within the industry, particularly among traditional contractors and builders who are accustomed to conventional construction methods. Overcoming these barriers will require concerted efforts from governments, industry stakeholders, and educational institutions to promote awareness, provide training opportunities, and incentivize the adoption of BIM and MMC.

> “MMC has emerged as a game-changer in the construction industry, offering new methods and techniques for building faster, smarter, and more sustainably.”

Furthermore, in the Middle East, the adoption of industrialized construction systems involves a combination of local production and the importation of components. While some elements are manufactured in the region to meet local demand and adapt to specific environmental conditions, other components and advanced technologies are imported from countries with specialized capabilities. This strategy varies depending on the project, resource availability, and required quality standards. Some local companies have established production plants for prefabricated and modular elements, while others import cutting-edge technology and specialized components from countries such as Europe and the United States. This hybrid approach allows Middle Eastern countries to leverage both local resources and international best practices, ensuring efficiency and quality in the region's construction projects.

Looking ahead, the future of construction in the Middle East is likely to be shaped by continued advancements in BIM and MMC technologies. As these tools become more widely adopted and integrated into standard construction practices, we can expect to see further improvements in project efficiency, sustainability, and innovation across the region. By embracing these transformative technologies, the Middle East can position itself as a global leader in modern construction practices, setting new standards for excellence and sustainability in the built environment, paving the region's way towards a more sustainable and inclusive future for all its inhabitants.

by **Agustín Manzano** I Senior Manager I Climate & Sustainability I Deloitte Spain

Javier Durán I Manager I Climate & Sustainability I Deloitte Spain

> "By embracing these transformative technologies, the Middle East can position itself as a global leader in modern construction practices."

Navigating the construction industry green evolution

Sustainability has evolved from a mere trend to a fundamental lifestyle, influencing daily choices from food to travel. Consumers worldwide now expect sustainability to be integrated into products and services across various industries.

In construction, sustainability entails designing, constructing, and operating buildings with minimal environmental impact and maximum social and economic benefits. This involves using eco-friendly materials, energy-efficient systems, waste management, and creating healthy indoor environments. The primary goal is to conserve natural resources, decrease greenhouse gas emissions, and enhance the well-being of occupants and the community. Sustainable construction is integral to modern projects and contemporary building designs.

Environmental impact of traditional construction practices

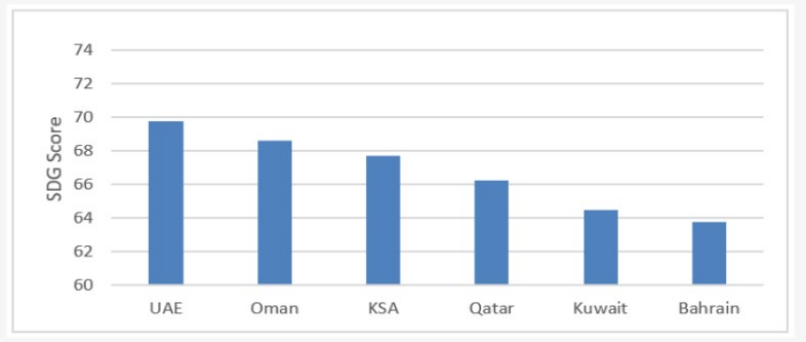
Traditional construction methods, vital for infrastructure and housing needs, carry significant environmental consequences. Globally, construction consumes around 3 billion tonnes of raw materials annually, or 40% of global consumption[1]. Moreover, circa 30% of building materials end up as waste. Globally, more than 10 billion tons of construction and demolition (C&D) waste are produced yearly from building and infrastructure construction, demolition, and land excavation activities. The nature and large quantity (30–40% of the total waste generation globally) of C&D waste generation contribute to several negative impacts on the environment, economy, and society[2]. The C&D waste management process demands substantial financial investments and human resources. It involves setting up specialised equipment for waste collection, sorting, and transportation, as well as facilities for recycling, energy recovery, and larger landfill capacities to dispose of waste.

These alarming statistics underscore the pressing demand for sustainable alternatives in the construction sector. The environmental impacts stem from resource extraction, energy use, waste generation, and other aspects of conventional building practices. Key concerns include resource depletion, energy consumption, waste generation, carbon emissions, water usage, land use, habitat disruption, and air and noise pollution. Crucial steps in mitigating the environmental effects of traditional construction methods include embracing eco-friendly materials, integrating energy-efficient technologies, and adopting sustainable design principles.

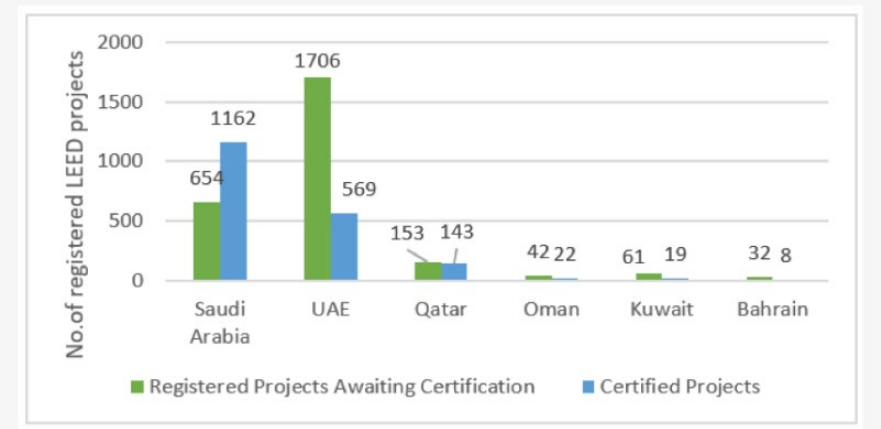
Compliance directives

Globally, the construction industry is significantly influenced by a range of regulatory guidelines and initiatives aimed at promoting sustainability. These include the Leadership in Energy and Environmental Design (LEED), the Building Research Establishment Environmental Assessment Method (BREEAM), the International Energy Conservation Code (IECC), and the United Nations Sustainable Development Goals (SDGs). These initiatives focus on providing green building certification, establishing minimum energy efficiency standards, and fostering sustainable building design, construction, and operation on a global scale.

SDG ranking of GCC countries[3]



Number of LEED registered projects in GCC[4]



Furthermore, international agreements such as the Paris Agreement and the recent COP 28 (UN Climate Change Conference of the Parties) play a pivotal role in encouraging the industry to reduce carbon emissions and embrace sustainable building practices, while also striving to limit global warming and address climate change.

Collectively, these global regulatory guidelines and initiatives are instrumental in shaping sustainable construction practices and promoting environmental responsibility within the construction industry worldwide.

Embracing sustainable construction: The evolution in GCC countries

Sustainable construction encompasses a range of practices and principles aimed at minimising the environmental impact of building activities while promoting long-term economic and social benefits. Some of the key sustainable practices are explained below:

Use of environmentally preferable products (green material)

Demand for sustainable building materials continues to surge worldwide. The global green building materials market size was valued at USD 422.27 billion in 2023 and is projected to grow from USD 474.21 billion in 2024 to USD 1,199.52 billion by 2032, exhibiting a compound annual growth rate (CAGR) of 12.3% during the forecast period[1]. This surge reflects increasing demand for environmentally responsible construction solutions.

Innovative sustainable materials include transparent wood, structural insulated panels (SIPs), cross-laminated timber (CLT), Self-Healing Concrete, Algae-Based Materials, 3D-Printed Earth, Low-Carbon Concrete, AI-Optimised Material Formulations and are transforming how we build. The use of these materials improves energy efficiency and helps combat cities' urban heat island effect.

Minimize non-renewable energy consumption

One major benefit of reducing energy usage on construction sites is lower operating costs. As utility bills increase due to rising electricity rates, any reduction in demand is useful to save money in the long run, enhancing sustainability. Upgrading to high-efficiency equipment, implementing automated lighting and sensors, integrating renewable energy sources, and adopting passive cooling strategies all contribute to energy conservation. Additionally, smart devices, building automation, and material reuse further support sustainable construction practices, minimising environmental impact and operating costs.

Waste management

Effective waste management in construction projects requires strategic decision-making in the design, planning, and tendering stages to minimise material waste. Studies suggest a potential 40% [b] reduction in C&D waste through proper planning. Government regulations, penalties, subsidies, and waste disposal charges can influence stakeholder behaviour and enhance the economic feasibility of waste management. Economic drivers such as landfill taxes and subsidies encourage waste minimisation. Government laws, designated disposal areas, low-waste technologies, and stakeholder education support sustainable waste management. Temporary bins, on-site sorting, and real-time tracking systems further improve waste management practices.

> "Global regulatory guidelines and initiatives are instrumental in shaping sustainable construction practices."

Impact of use of sustainable material/practices in construction[5]

Material	Sustainability Benefit	Cost Reduction	Energy Efficiency Improvement
SIPs	High insulation	15-20%	40-60%
CLT	Carbon reduction	10-15%	20-30%
Bamboo	Rapid renewability	5-10%	10-20%
Solar Tiles	Energy generation	30-40%	50-70%
Cool roofing	Heat reflection	20-25%	30-40%

Path to sustainable future - conclusion

The emphasis here is on sustainable design principles, aiming to optimise site potential, minimise non-renewable energy consumption and waste, use environmentally preferable products, protect and conserve water, improve indoor air quality, enhance operational and maintenance practices, and create healthy environments. This aligns with certifications such as LEED and BREEAM and complies with regulatory directives. These practices pave the way for a sustainable future, focusing on green energy, C&D waste management, green materials, and the potential benefits of cost reduction and energy efficiency, ultimately reducing carbon emissions.

Sustainable construction is an integrated, holistic approach that positively impacts all phases of a building's life cycle and encourages compromise and trade-offs.

Source:

1. Source: https://www.fortunebusinessinsights.com/green-building-materials-market-102932
2. (Source for statistics: Sustainability | Free Full-Text | Review on Sustainable Construction and Demolition Waste Management—Challenges and Research Prospects (mdpi.com))
3. Jeffrey, D.S.; Guillaume Lafortune, G.F.; Drumm, E. Sustainable Development Report 2023 Implementing the SDG Stimulus Includes the SDG Index and Dashboards; United Nations Sustainability Development Goals; United Nations: New York, NY, USA, 2023. [Google Scholar] [CrossRef]
4. Source: https://www.usgbc.org/leed
5. Source for statistics: https://www.greenmatch.co.uk/blog/green-building-materials

By **Vatsala Gupta** | Manager, Audit & Assurance | Deloitte Middle East

Yogesh Tripathi | Senior Manager, Audit & Assurance | Deloitte Middle East

Erantha Maithripala | Director, Audit & Assurance | Deloitte Middle East

> "Sustainable construction is an integrated, holistic approach that positively impacts all phases of a building's life cycle."

New ways of contracting: introduction of new standard forms of construction contracts in Abu Dhabi

We have seen a concerted effort from government authorities throughout the GCC to improve the reputation of the construction sector in order to continue to attract foreign investment in the region. These efforts include a noticeable shift towards more sustainable practices, as highlighted by government-led carbon targets, heightened awareness of construction emissions, and indications that developers are increasingly mindful of the broader impacts of construction works.

In order to source for the scale of projects planned across the region in the next 5-10 years, the GCC will need to attract a significant number of high-quality contractors back to the region. There will be fierce competition on projects – even within the region – to attract the highest quality and most experienced contractors in order to ensure the required timescales and standards are met.

Release of new Abu Dhabi government constructioncontract

The Abu Dhabi Projects and Infrastructure Centre (ADPIC) was established in September 2023, adopting several key responsibilities with regards to the management and implementation of the Emirate's capital projects. In this context, Dentons & Co. has collaborated with ADPIC to release an updated and revised version of the Abu Dhabi Government Construction Contract (ADGCC). The ADGCC reflects ADPIC's desire to encourage procurement best practices to ensure the Abu Dhabi construction sector attracts the top quality leading local and international contractors needed to deliver the numerous world-class projects being developed in the Emirate. The ADGCC is mandatory for all government capital construction projects being executed under the management of Abu Dhabi Government Entities (ADGEs). With the Abu Dhabi Government having approved a budget of around AED66bn for 144 new capital projects in Abu Dhabi , the updated ADGCC represents a significant milestone in the Emirate's construction market.

The new ADGCC was developed following extensive workshops with the concerned ADGEs and feedback received from key contractors. It uses FIDIC 1999 as its base and focuses on the early resolution of disputes, appropriate and equitable risk allocation, more stringent environmental requirements, and increased protection of workers' rights. We highlight below some of the key changes to the ADGCC aimed at addressing concerns raised by contractors during the consultation process.

The recognition of the importance of a balanced risk profile is encouraging. If that same philosophy of fair risk allocation is adopted throughout the procurement and contract administration processes, then this has the potential to significantly change the contracting landscape in Abu Dhabi.

Key changes to the ADGCC

Dispute Avoidance/Adjudication Boards (DAABs)

Both the ADGEs and contractors placed an emphasis on dispute avoidance and were keen for DAABs which, although still fairly uncommon in the Middle East, have developed into an increasingly popular alternative dispute resolution process in other regions. As a result, the revised ADGCC now mandates the appointment of standing DAABs to adjudicate disputes throughout the duration of the contract.

The main benefit of a DAAB is that potential disputes may be resolved quickly and assist with a contractor's cashflow. The use of a standing DAAB also encourages better practice from all parties; the knowledge that the 'Engineer's Decisions' will be scrutinised by an independent board of consistent members during the project, should encourage contractors to only raise strong claims and encourage Engineers to act impartially and ensure their decisions are robust and supportable.

Engineer's duties and authorities

A key issue for contractors in the region was the role of the Engineer. There was a commonly held view that the Engineer is often unable (or unwilling) to comply with its contractually assigned duties - whether due to a lack of experience, resources, or independence - often leading to issues and delays on the project, particularly with regards to shop drawing approvals and variations.

To help address these issues, the revised ADGCC contains an express obligation on the Employer to ensure that the Engineer is sufficiently resourced to comply with their assigned duties. Also, as above, the standing DAAB should also help to apply more scrutiny on the Engineer.

Protection of the environment

In line with Abu Dhabi's efforts to improve sustainability and foster ambitious climate action, the revised ADGCC now includes more stringent environmental clauses. Contractors are required to comply with all environmental regulations, procedures, and guidelines issued by the Abu Dhabi Government, as well as any additional environmental requirements identified in the Specifications.

Contractors are also required to use best practices in sourcing sustainable materials and avoiding environmentally harmful materials, employing a site waste management plan, and adopting environmentally friendly working methods. The revised ADGCC uses clauses proposed by the Chancery Lane Project – a global network of lawyers and business leaders that has drafted contractual clauses to encourage rapid decarbonisation and reduce climate impact.

"We have seen a concerted effort from government authorities throughout the GCC to improve the reputation of the construction sector in order to continue to attract foreign investment in the region."

Labour laws

ADPIC, the ADGEs, and the Contractors active in the region, were all in favour of strengthening labour and welfare requirements and ensuring subcontractors' compliance with such laws.

Accordingly, the revised ADGCC now provides that the Engineer has the authority to undertake inspections and/or audits to ensure compliance by the Contractor, its subcontractors, and suppliers. The Employer may also withhold payments until the Contractor has evidenced that it has rectified its breach of labour and welfare laws. The greater oversight provided in the revised ADGCC will help ensure more uniform compliance with labour laws by international and local contractors.

Conclusion

The revised ADGCC seeks to provide a fair and balanced contract with an effective 'Engineer's Role', reasonable payment terms, and a clear regulatory and dispute resolution framework. This reflects ADPIC's intentions of encouraging collaborative working arrangements as well as reducing construction disputes – all while maintaining the strong reputation of Abu Dhabi's construction market.

We hope these intentions will spread beyond the new contract and will be reflected in the parties' actions throughout the entire project lifecycle. We also look forward to seeing these practices adopted more widely across the region, given the competing demand for high quality contractors.

Source:

1. https://www.forbesmiddleeast.com/industry/real-estate/adpic-announces-launch-of-projects-worth-179b-in-2024

by **Dean Ryburn** I Partner I Co-Head of Dentons' Middle East Construction and Dispute Resolution Practice

Suzannah Fairbairn I Partner I Dentons' Middle East Construction and Dispute Resolution Practice

Melissa Mallon I Associate I Dentons' Middle East Construction and Dispute Resolution Practice

"The revised ADGCC seeks to provide a fair and balanced contract with an effective 'Engineer's Role', reasonable payment terms, and a clear regulatory and dispute resolution framework."

Building the future: AI & data revolutionizing construction

The construction industry has had its fair share of challenges over the years, including cost overruns, schedule delays, safety issues etc. With the advent of Artificial Intelligence (AI) and Big Data Analytics however, the industry is poised for a major transformation. Let's explore how AI and Data are changing the game for the construction industry, and what companies can do to not just stay relevant but gain a sustainable competitive advantage.

Data at the epicentre of disruption

Traditionally, construction data has been limited to simple structured data such as contractual agreements, financial and budgetary information, project timelines and milestones, resource allocation, and other data sets important to the construction process i.e., information that can be easily entered and managed in a simple tabular structure. However, the industry is now experiencing an explosion in unstructured data. This type of data includes a broad range of information types, including design specifications, satellite imagery, LiDAR (Light Detection and Ranging) data, pdf documents, reports, images, and videos captured by drones, mobile devices, and cameras on job sites, as well as data from sensors and other IoT (Internet of Things) devices.

To put things in perspective, let's take the LiDAR as an example. LiDAR, a cutting-edge optical remote-sensing technique, utilizes laser beams to meticulously map the Earth's surface, delivering highly accurate measurements. It's becoming increasingly favored as a cost-effective alternative to traditional surveying methods such as photogrammetry. As such new applications come to being, new sources of data are also emerging through them at a rapid pace, disrupting the "Data" ecosystem and along with it, the potential to harness data for quicker, better and more reliable decisions.

AI driven value generation

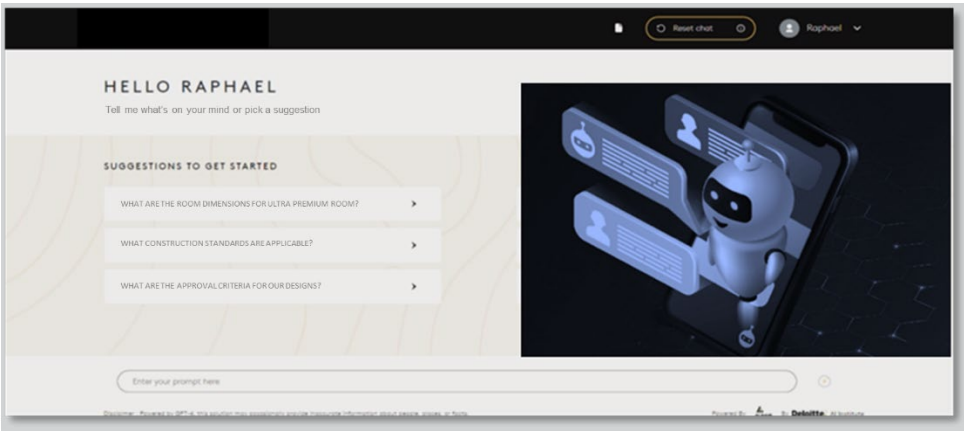
Whilst the "Data" ecosystem is well and truly underdoing massive disruption, it can be quite difficult and overwhelming for organizations to extract meaningful information and insights from it for robust decision making without a clear business strategy, use case evaluation, tools, and technologies to do so. While traditional reporting through descriptive analytics (dashboards, scorecards etc.) will always remain important and critical starting points to gain basic insights from the data, Artificial Intelligence (AI), or in other words, advanced ability of machines to interpret large amounts of data through human like intelligence, is without an iota of doubt a major differentiator in driving exponential value from data. Leveraging machine learning, natural language processing, computer vision, Gen AI etc. to gain deep insights into project performance, predict delays or safety risks, reduce waste etc. are not just trendy things to do, but are increasingly becoming table stakes in a competitive industry where revenues and margins are constantly challenged.

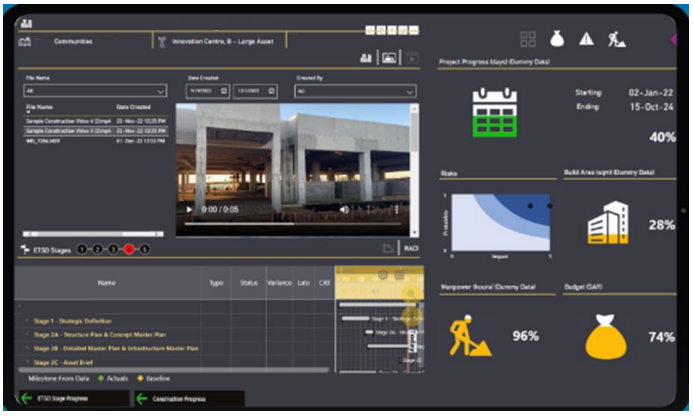
At Deloitte Middle East, we work with several clients that are at the cutting-edge of the construction industry. From helping develop a robust AI strategy to implementing high value use cases to operating AI Centres of Excellence, we do it all. Below is a glimpse of some of the high impact work we have delivered to our clients.

"Leveraging machine learning, natural language processing, computer vision, Gen AI etc. to gain deep insights into project performance, predict delays or safety risks, reduce waste etc. are not just trendy things to do, but are increasingly becoming table stakes in a competitive industry where revenues and margins are constantly challenged."

For a major Smart City client, Deloitte has developed a Gen AI platform to summarize design requirements, identify design inconsistencies across briefs and perform compliance checks against safety and technical standards, all while offering a human-like conversational experience for architects and construction managers (Refer to the image below). To enable this, the platform processes hundreds of Asset Briefs, Master Plans, Design Submissions, Study Reports, Codes & Standards, Best Practices, Strategy Documents, Research Summaries, Drawings, etc.

Additionally, we have also developed a state-of-the-art construction management and insights app for the client, which allows multiple construction project surveyors and managers to upload project progress information, images, and videos in real time and amalgamate it with system data on plans, financial projections, risks, etc. This is enabling executives to not just be up to date with the latest progress but make decisions with real-time information to avoid project delays, mitigate safety risks, clear vendor payments on a timely basis etc. (Refer to the images below)





What's The Magic Recipe?

If you are in the construction industry and aspire to bring such a differentiating proposition to your business, you might be asking yourself multiple questions: How do I get started on such a journey with data? How do I stay the course to continuously increase/ optimize its usage? How do I create a sustainable business advantage for my organization?

For starters, we strongly recommend that "AI & Data" is looked at as a must-have long term capability in an organization rather than through a siloed use-case driven lens.

To achieve such a long-term capability, we have a 3-point formula for you:

- A Definitive AI & Data Strategy: Start by defining a clear vision for how you want AI & Data to drive value for your organization, in alignment with your broader organizational goals. Identify and prioritize use cases and applications that are aligned with the vision, the data required to implement them and define the Operating model (Technologies, Processes, People etc.) that can enable effective implementation of the use cases.
- A World-Class Data Management Capability: Establish a robust and secured data management capability to effectively collect, store, process, and govern data in alignment with well-known standards, such as National Data Management Organization (NDMO) in Saudi Arabia, Data Management Association (DAMA) etc.
- Focused Use Case Implementation and Value Realization: Realizing value from AI & Data needs perseverance and unwavering focus on execution of the strategy defined. This is often where most companies fail and most AI projects end up not moving beyond the experimentation phase. Companies that are maximizing impact are the ones fully invested in moving from experimentation to operationalization for the long run.

> "We strongly recommend that "AI & Data" is looked at as a must-have long term capability in an organization rather than through a siloed use-case driven lens."

Source:

1. https://www.bigrentz.com/blog/big-data-in-construction
2. https://desktop.arcgis.com/en/arcmap/
3. GIS for Construction (arcgis.com)
4. https://neuroject.com/big-data-in-construction/
5. https://www.researchgate.net/publication/372764029_Applications_of_Artificial_Intelligence_AI_in_the_construction_industry_A_review_of_Observational_Studies

by **Aditi Nitin** | Partner | Consulting AI & Data | Deloitte Middle East

Sripada Vittala | Senior manager | Consulting AI & Data | Deloitte Middle East

Wriddhi Majumder | Senior manager | Consulting AI & Data | Deloitte Middle East

Gurkeerat Grewal | Senior consultant | Consulting AI & Data | Deloitte Middle East

A commercial approach to project planning to drive positive financial and ESG outcomes in capital projects

Introduction

Project planning, while often being narrowly associated with the preparation for the design and construction stages of project development, plays a key role during the Transaction stage and in governing the Financial and Environmental, Social & Governance (ESG) ambitions of capital projects and in determining the impact across the whole asset lifecycle. The outcome of effective project planning in synergy with the financial model development will influence the project's assigned budgets, delivery timeframe, and overall risk-adjusted cash flow at each stage of the asset development cycle. For this reason, special attention should be given to the underlying assumptions of the CAPEX and OPEX considerations, as well as the ESG ambitions, delivery model options, and the associated risks during execution, operation, and closure.

A detailed explanation of these considerations is outlined below, covering the project planning elements to be included at the Transaction stage which is when it has the highest impact.

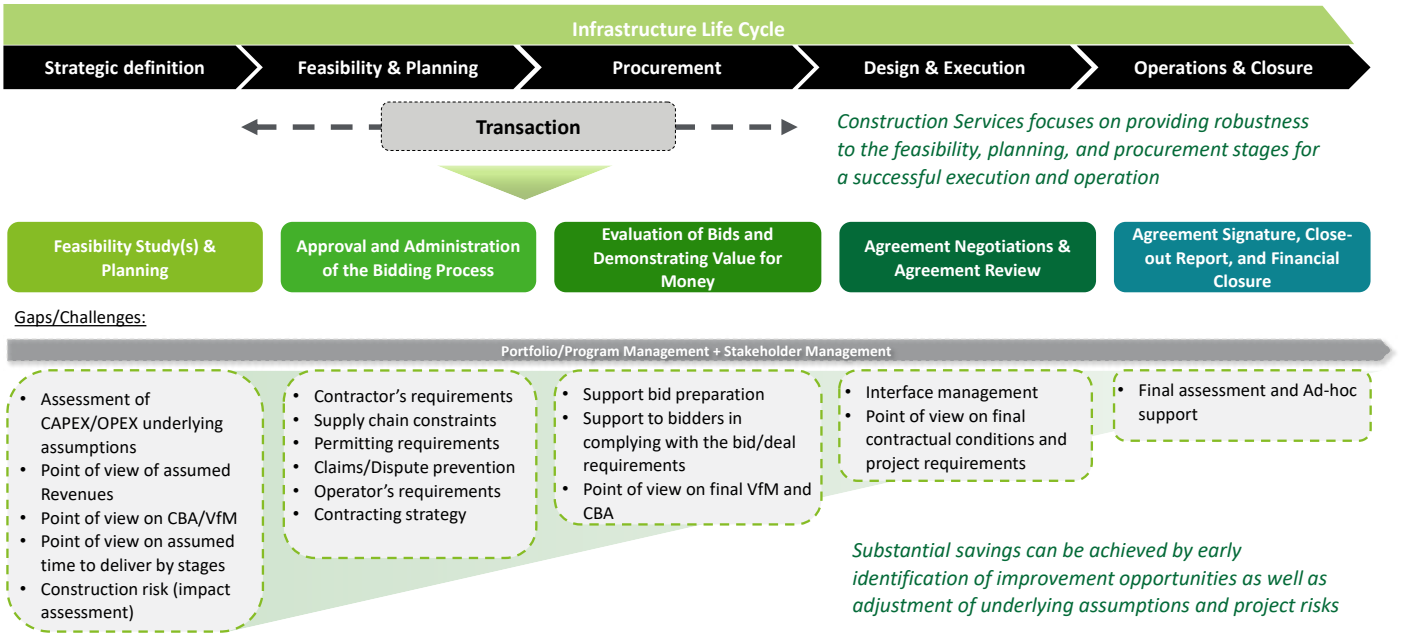
Current gaps at Transaction stage

To understand common gaps during the Transaction stage is important to have a clear picture of the asset lifecycle and Transaction phases. The Transaction occurs during the Feasibility&Planning and Procurement stages, and it can be separated into five key steps, namely Feasibility Study, Approval and Administration of the Bidding Process, Bid Evaluation, Agreement Negotiations, and Financial Closure. During the Feasibility Study, the assumptions and input in the model are frequently decided by the Financial Advisor who assumes CAPEX and OPEX as a percentage of expected revenues or takes this input from the Technical Advisor. The construction timeframe as well as the determination of Construction and Operational risks are similarly assumed. Here is where the gap is: the underlying assumptions of these values need to be assessed from different angles. The technical aspects need to be challenged by proposing potential value engineering opportunities, the assumed timeframe requires evaluation from a project delivery perspective, the contractual agreements should mitigate claims and dispute risks; and finally, these points of view need to be aligned with the financial objectives and ESG considerations, evaluating sustainability and regulatory requirements. Some of the common gaps at each stage of the Transaction are listed in the diagram below. Ideally, the gaps should be covered as the project approaches Financial Close. This will allow substantial savings throughout the asset lifecycle and significantly reduce remediation expenses.

Developing CAPEX underlying assumptions

The CAPEX estimation is often overlooked despite being a substantial proportion of the budget. Value engineering and optimization opportunities are to be assessed at the initial stage. From reviewing design assumptions and "over-dimensioning", to understanding the proposed construction methodologies, procedures, phasing, and supply chain. Key questions to be answered are: What portion of the works can be delivered by local contractors and what services, or equipment, must be imported? What is the need for Enabling Infrastructure? How are CAPEX and the expected revenue correlated? Would the use of advanced technology allow potential savings? Are ESG considerations properly incorporated?

The answer to these, and other relevant questions, will help stakeholders to understand the underlying assumptions and arrive at a more representative estimation of the CAPEX value.



Developing OPEX underlying assumptions

Operational considerations are to be incorporated at the feasibility stage and validated as the asset development progresses through its lifecycle. While this might seem evident, the complexity of the operations of certain assets and the rapidly evolving technology in operational systems could impact the variance of the expected outcomes and add to the uncertainty of the financial projections.

This uncertainty can be mitigated by engaging subject matter experts in the operations of a particular asset at the early stages of the project, and by maintaining close coordination between stakeholders and advisors who have the required knowledge and experience to address key questions related to the expected asset's operational requirements and associated asset management technologies. It is crucial to understand the target operating model and the enabling technologies to achieve it; in addition to estimating how these technologies are evolving relative to the asset timeframe for completing the execution and entering the operational stage.

Other factors to consider are the existence of a detailed asset management plan, the availability of qualified workforce, the cost of maintaining long-term operational efficiency, and the evolving regulatory framework under which the asset operates. Furthermore, financial aspects such as the effect of inflation and economic cycles on the operational cost throughout the asset lifecycle should be carefully embedded in the cash flow projections.

These considerations will help decision-makers understand the sensitivity and potential impact of the OPEX leading to a clearer understanding of the underlying assumptions, resulting in a more accurate estimation of the OPEX value.

ESG Considerations

Strong ESG performance is highly correlated to capital value growth and protection. Embedding sustainability into capital projects in the early stages not only supports the global transition towards net zero but also unlocks access to diverse financing options, improving the investment eligibility and attractiveness of the asset. Globally, the majority of institutional investors and financial institutions have adopted ESG as a key element of their wholesale investment and financing requirements, as they recognize this affects prospects for capital growth and protection. By tapping into a rapidly growing array of tools and technologies available, financial outcomes can be optimized to ensure long-term viability of capital projects.

Clear examples include :

- Conducting Whole Lifecycle Carbon Analysis (WLCA) by following guidance issued by industry leading institutions such as RICS, to calculate the environmental impact in terms of embodied and operational carbon emissions produced by an asset throughout its lifecycle and protect the asset against accelerated obsolescence.
- Evaluating capital projects against best practice green certifications and rating systems such as LEED and BREEAM to identify opportunities in the planning and design process to reduce environmental impact, improve energy efficiency and optimise operational expenses. In the context of real estate, this may include exploring energy-efficient technologies and practices, such as smart building systems and powering assets with renewable energy sources. Embracing Generative AI and Digital Twin technology can significantly add value to this process.
- Developing sophisticated financial models to assess commercial feasibility of capital projects, and ability to investigate and revise approach by testing different scenarios and sensitivities, to maximise financial and environmental benefits. This process should involve consideration of increasingly stringent regulatory obligations and investment criteria, which directly impacts access to green capital.

Embedding ESG into Project Planning is both a risk mitigation and value creation strategy. With pressure mounting from all directions globally to transition to net zero, aiming for mere ESG compliance can be considered a high-risk strategy from both an environmental and commercial standpoint.

Avoiding the Brown Discount	Unlocking the Green Premium	Driving Operational Efficiencies	Embracing Competitive Advantages	Gaining an Early Mover Advantage
Capital value protection and safeguarding against obsolescence in light of looming increased regulatory requirements	Investor/ occupier demand for green building stock outweighing supply, driving green premium on rental and sales revenue	Global supply chain pressures inflating OPEX budgets, creates urgency to optimize operations and create cost savings	Capitalising on access to solar power in region, already the cheapest power source globally, to create efficiencies	By investing now, capital expenditures could be allocated over a longer period, reducing the financial impact

Determining Construction and Operational Risks

Closely linked to the CAPEX and OPEX underlying assumptions, understanding, classifying, and quantifying Construction and Operational risks during the Transaction is paramount to "risk-adjust" the expected development cashflows. Understanding the Construction and Operation of the specific asset is crucial to identifying and breaking down the associated risks. Aspects such as complexity, accessibility, terrain, security, enabling infrastructure, permitting and regulatory compliance, expected delivery time, contractual framework, operational systems, qualified workforce, and political exposure are only some considerations when estimating risk. Furthermore, the engaged contractors and service providers should have enough liquidity to mobilize and deploy equipment as well as withstand issues that may arise throughout the execution and operation, in addition to having the appropriate insurance coverage and complying with the regulatory requirements. Areas that could give space to potential claims and disputes should also be identified so the necessary contractual arrangements can be implemented.

The risks shall be classified in terms of likelihood and impact, and then be translated to a proportioned risk-adjusted budget allocation. This will enable readiness to overcome materialized risks that could jeopardize the asset development.

In conclusion, a thorough analysis of the underlying assumptions of key commercial and ESG variables in the development of Project Planning during the Transaction stage has proven beneficial to the asset delivery and operation, which usually translates into significant savings throughout the asset life cycle.

Source:

1. Verdantix 2024financ
2. Verdantix 2024

by **Gonzalo Quincot** | Assistant Director | Corporate Financial Advisory Government and Infrastructure I Deloitte Middle East

Maysera AlAbdula | Assistant Director | Corporate Financial Advisory Government and Infrastructure I Deloitte Middle East

Hannah Hassler I Senior Associate | Infrastructure & Real Estate I Deloitte Middle East

> "Embedding ESG into Project Planning is both a risk mitigation and value creation strategy."

ESG implementation is key to developing Real Estate of the future: Importance, trends, how to drive & achieve results

ESG is key to developing Real Estate of the future

ESG refers to Environmental & Social impact of an organisation and the robustness of Governance mechanisms to manage impact.

As the ESG landscape across the region continues to mature at pace, ESG commitments are becoming increasingly central to owners and occupiers within the Built Environment. This is reflected by increasing understanding of and commitment to achieving best practice standards across the ESG spectrum.

Key considerations

Environmental Impact

- Green leasing
- Physical risk (flooding, fire, sea level rise)
- Transition risk
- Regulatory risk
- Clean energy
- Energy efficiency and management
- Greenhouse gases (GHG) emissions management
- Waste impacts
- Sustainable building design

Social Impact

- Community relations and placemaking
- Creation of social value
- Workplace health and safety
- Employee diversity, equity and inclusion
- Labour and human rights management
- Disability access to buildings
- Accessibility standard(s) compliance
- Hazardous building materials

Governance

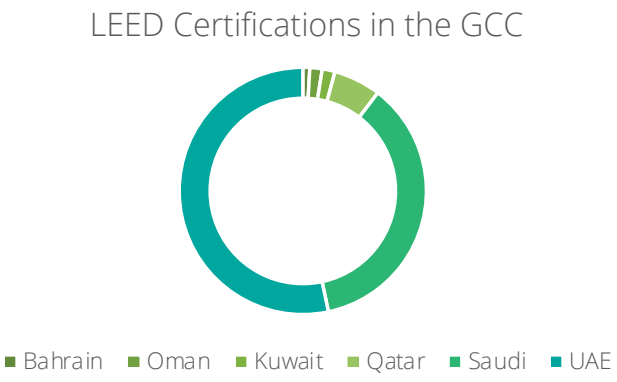
- Board diversity and structure
- Bribery, corruption and fraud policies
- Compensation policies
- Employee diversity, equity and inclusion
- Transparency and disclosure

Rise of ESG Leaders in GCC Real Estate

Globally, over 60% of real estate investors have adopted ESG as part of their investment strategy, as this affects "prospects for rental and capital growth, and susceptibility to obsolescence". This top-down approach has the power to create positive environmental, social and economic impact at scale. Following the global narrative, large corporate and institutional owners and occupiers are driving ESG strategies and initiatives in the GCC, further demonstrated by the significant uptick in globally recognised certifications such as LEED and WELL.

55%[1]
increase in LEED certified Gross Floor Area across the GCC from 2020-2024

As of Q3 2024 > 40,000 sq m
of Gross Floor Area is WELL certified across the GCC[2]



ESG commitments set by major GCC private and public players

Globally, over 60% of real estate investors have adopted ESG as part of their investment strategy, as this affects "prospects for rental and capital growth, and susceptibility to obsolescence". This top-down approach has the power to create positive environmental, social and economic impact at scale. Following the global narrative, large corporate and institutional owners and occupiers are driving ESG strategies and initiatives in the GCC, further demonstrated by the significant uptick in globally recognised certifications such as LEED and WELL.

Government & Regulatory Bodies

Across the region most countries are driving ESG outcomes by targeting Net Zero, with UAE, Qatar and Oman targeting to be Net Zero by 2050, while KSA, Bahrain and Kuwait are currently targeting Net Zero by 2060.

Investors / Investment Managers

Investors incorporate ESG into investment mandates, such as Kuwait Investment Authority (KIA), the world's third largest sovereign wealth fund, announced it will ensure its entire portfolio adheres to ESG standards.

Global SWF Governance, Sustainability and Resilience (GSR) scorecard ranked KSA Public Investment Fund (PIF) as joint second worldwide and second in the Middle East, demonstrating world leading efforts to improve ESG.[3]

Financiers

Green bonds, ESG funds and sustainability linked loans, are starting to make their way into the region, for instance Mubadala established an independent ESG fund; Emirates NBD raised US$1.75 Bn, the GCC's first sustainability-linked loan; Masdar City in Abu Dhabi structured and issued green bonds to facilitate future growth and sustainable asset development.

Asset Managers

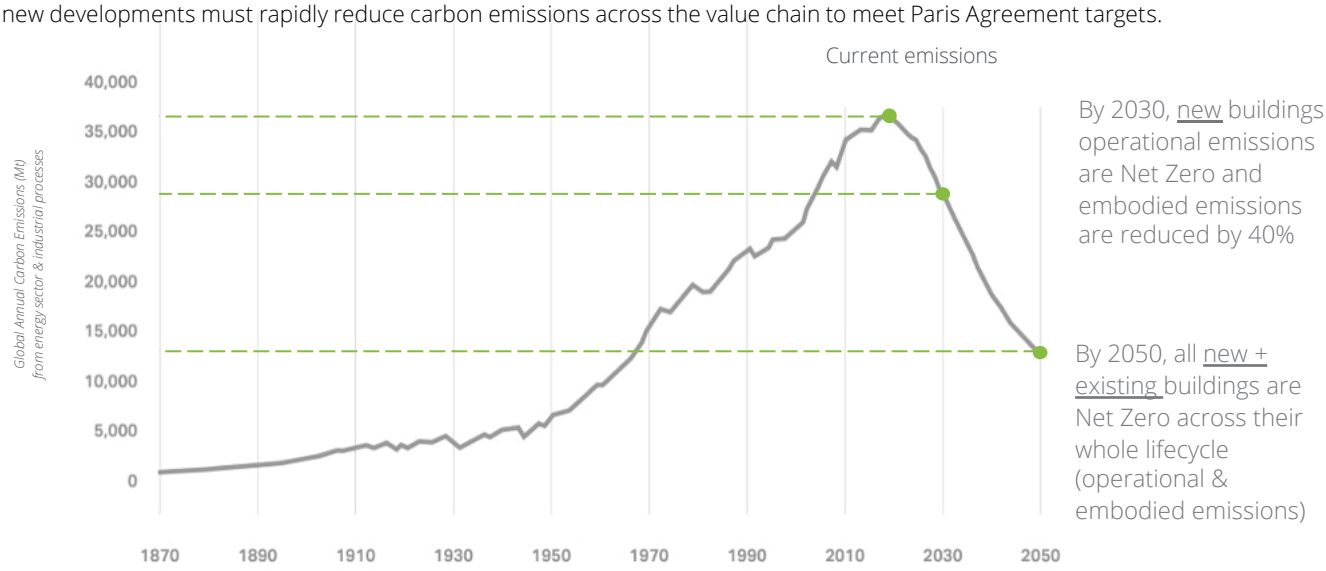
Asset Managers play a key role in defining ESG ambitions and setting strategic roadmap to improve ESG performance, in line with their role in driving value, identifying risks and creating risk mitigation strategies.

Source: Deloitte research

Focus topic: Decarbonisation and its potential environmental & economic impact

Decarbonisation is a strategic priority for the ESG leaders in the Built Environment, as there is significant potential to make positive Environmental Impact by focusing on this objective for new developments and existing assets.

Globally, emissions are projected to increase 9% by 2030, putting us off-track to meet the Paris Agreement targets to halve emissions by 2030 and reach Net Zero by 2050. The Built Environment contributes to over 37% of Global Carbon Emissions. Both existing assets and new developments must rapidly reduce carbon emissions across the value chain to meet Paris Agreement targets.



Source: Graph : ABC, IEA & UNEP, 2020
UN, 2023; UN Global Alliance of Buildings & Construction, 2023; Deloitte, 2022; McKinsey, 2022; RICS, 2023

It is possible for the Built Environment to reach Net Zero by 2050, by implementing existing, proven technologies and practices, such as Whole Life Carbon & Cost Assessments. The RICS Whole-life Carbon Assessment (WLCA) Standard (2nd Edition) is world's only comprehensive standard for providing a whole life carbon methodology for projects and assets. The objective of the Whole Life Carbon Assessment is to "ensure the minimum overall lifetime carbon emissions and the maximum lifetime resource efficiency". WLCA 2nd Edition can be used in conjunction with the International Cost Management Standards (ICMS) 3rd Edition which offers a globally consistent reporting taxonomy. Implementing solutions such as WLCA 2nd Edition & ICMS 3rd Edition provide developers, investment managers and asset managers with the ability to reduce costs and carbon emissions across the whole lifecycle of an asset.[4]

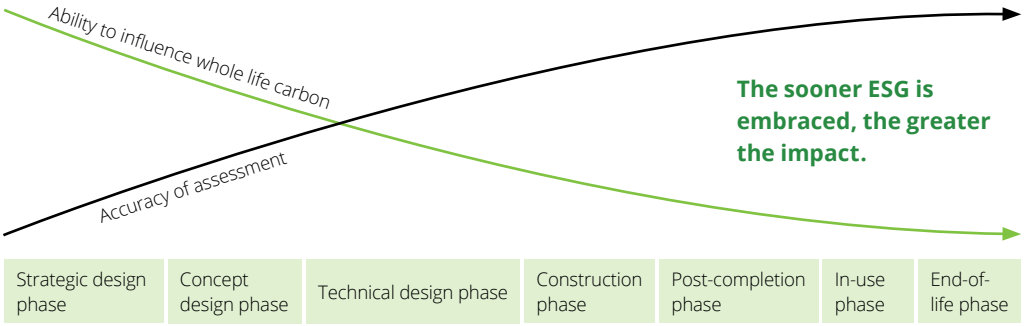
Potential of the GCC construction boom to create ESG impact at scale

The growing adoption of ESG in the midst of the GCC construction boom, demonstrates a significant opportunity to improve ESG performance within the region at scale. At every stage of property life cycle, there is an opportunity to create positive impact and drive financial performance via ESG strategic initiatives. Given 80-90% of project[5] value is created in the development stage, embedding ESG in the early stages of development is key to maximising and protecting capital value over the asset lifecycle.

GCC RE market value c. US $4.5 trillion (as at 2023)

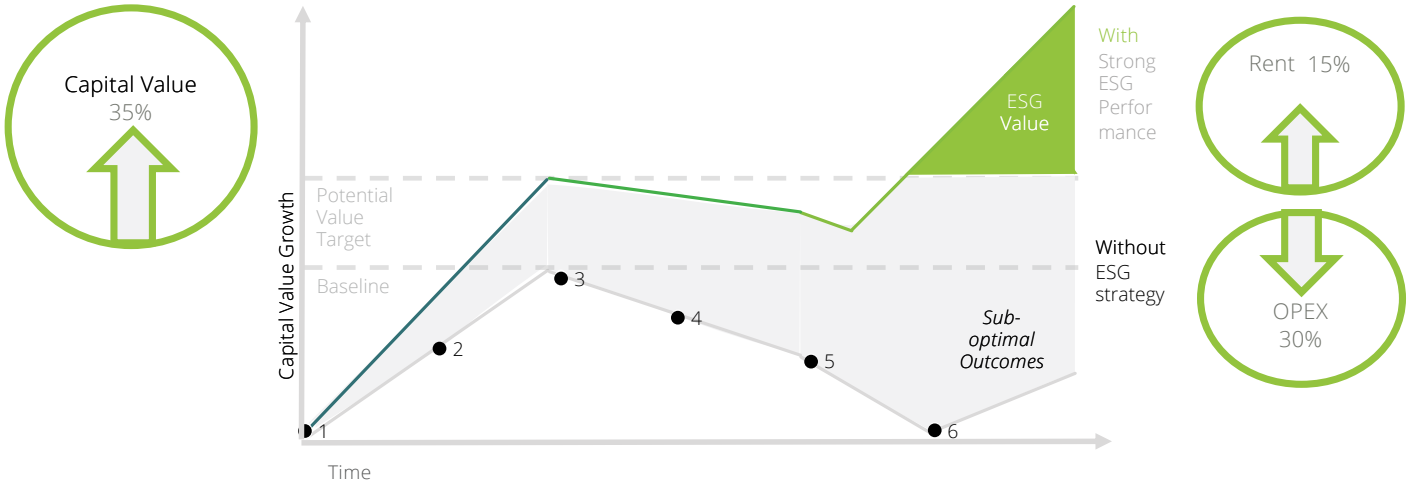
GCC construction pipeline value estimated at US $2 trillion by 2035

Source: Deloitte research



Way forward: Present the business case to continue to drive the ESG agenda

With 80% of project value developed in the early stages of development, embracing ESG from kick-off is essential for value creation and protection over the lifecycle of the asset. Developing and defining the business case to demonstrate the link between ESG initiatives and their positive financial and non-financial impacts is the key to compelling real estate investors and developers to carefully consider ESG ambitions and performance in the early stages of a project.[6]



Source:

1. https://www.usgbc.org/projects?Country=%5B%22United+Arab+Emirates%22%2C%22Saudi+Arabia%22%2C%22Qatar%22%2C%22Oman%22%2C%22Kuwait%22%2C%22Bahrain%22%5D https://www.gbci.org/gbci-mena
2. https://account.wellcertified.com/directories/projects/
3. https://www.pif.gov.sa/en/news-and-insights/newswire/2024/pif-ranks-second-globally-for-governance-sustainability-and-resilience/
4. International Cost Management Standard Coalition: Global Consistency in Presenting Construction Life Cycle Costs and Carbon Emissions, 3rd Edition (2021)
5. Urban Land Institute, 2021
6. Deloitte Powers of Construction 2023, 12th Edition

by **Oliver Morgan** I Partner I Infrastructure & Real Estate I Deloitte Middle East

James Hunt I Director I Infrastructure & Real Estate I Deloitte Middle East

Hannah Hassler I Senior Associate I Infrastructure & Real Estate I Deloitte Middle East

Deloitte.