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12th edition
Responsible construction
ecosystem
Deloitte GCC Powers
of Construction 2023



Foreword

We are pleased to present our 12th edition of the Deloitte GCC Powers of Construction.

As the world becomes more aware of the need and urgency to take appropriate measures to preserve our environment and plan for more sustainable solutions, sustainability and preserving our environment has become increasingly more of a focus area in the construction industry, where according to the United Nations Environment Program, the built environment accounts for 39 percent of gross annual carbon emissions worldwide.⁽¹⁾

Today considering the whole life cost of capital assets is more crucial than ever to making informed decisions about capital projects, taking into account the environmental and sustainability mitigations and plans at the project outset.

Often, the focus is on the vision and ambition the owners or investors may have for the capital project, with varying levels of interaction with other stakeholders and lenders at the outset. There is a large focus on the preliminary design and then the cost of construction, with several areas usually remaining to be designed and considered, including the overall approach to managing the asset for its lifecycle.

What would be ideal is the consideration of the entire lifecycle costs of the asset including but not limited to the costs of maintenance, repairs, and replacement and how decisions in the design should be coordinated with the operators to enhance the performance of the capital asset, as well as incorporating latest technology and ideas around sustainability, which could

contribute significantly to the efficiency and maintenance budgets of the assets throughout their life.

Starting to change the behavior and collaboration to think holistically about the performance of the asset over its entire lifecycle will result in better decisions benefiting owners/investors, lenders, the wider economy and ultimately, the environment.

Creating a robust process that embraces a holistic approach from design to decommissioning an asset offers investors a feasibility study that clearly articulates the assumptions for the project, embraces ESG (which several investors will require as a prerequisite to funding), and enhances transparency around budgeted return of investment. Given this level of transparency can be achieved through a set framework, such as a playbook for the industry, the potential to attract further foreign direct investment would be increased.

To deliver mega and giga projects successfully in the future, all stakeholders need to work through a structured framework, which drives a holistic and integrated process, while also catering for the rapid pace of change in the industry and region. An industry playbook which provides key policies and guiding principles for this shift to a 'whole-of-life' approach for capital assets – from the feasibility of a project, to incorporating all the sustainability goals throughout the lifecycle of the project upfront – is a critical and much needed change to avoid wasting time, resources and cash, while increasing stakeholder satisfaction and providing a governance

framework for how projects and programs are procured, assessed and delivered. This framework would also help drive accountability to the relevant stakeholders.

Despite a challenging environment, the region has remained resilient, and has led from the front on the vision for iconic and ambitious infrastructure and capital programs. This year with the hosting of COP28 in the UAE along with ambitious national agendas, there is a great opportunity across the region to shape the future of the industry – embracing new technologies and the future that the metaverse has to offer could deliver unimaginable potential and significant improvements for the industry.

We have sought to capture a range of topics in this 12th edition of the GCC Powers of Construction which provides a lens on both challenges and opportunities, including an overview of the GCC projects landscape, decarbonization best practices, unlocking the potential technology has to offer to the industry, and other insights from industry experts and practitioners who share their knowledge and expert views, assessments, and outlooks for the industry.

We hope this edition will serve as a valuable resource and that the insight shared in this publication encourages you to work towards a more sustainable built environment. ●

Source:

1. <https://www.weforum.org/agenda/2022/09/construction-industry-zero-emissions/#:~:text=According%20to%20the%20United%20Nations,CO2%20emitted%20in%20producing%20materials>

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

To deliver mega and giga projects successfully in the future, all stakeholders need to work through a structured framework, which drives a holistic and integrated process, while also catering for the rapid pace of change in the industry and region.

Contents



04

The GCC projects market outlook

07

Unlocking the potential - Digital twins and the Metaverse in the construction industry

11

The construction industry's call to action: Addressing the priorities and best practices of decarbonization

14

The whole life costing approach to better project outcomes

17

The ambition loop of government and private sector collaboration in decarbonizing the construction industry

20

Shining GreenLight on the construction industry



23

Implementing the Living Master Plan

26

The UK construction playbook - a blueprint for a more sustainable construction industry globally?

29

Asset development optimization through service integration across the asset's lifecycle

33

Construction industry survey: The Chief Executives' view

37

The shifting landscape of capital project disputes

The GCC projects market outlook



The GCC projects market has endured a series of unprecedented challenges in recent years. The global pandemic, followed by soaring inflation and geopolitical headwinds, have tested contractors, suppliers and engineering firms alike as they struggle to adapt to fast-changing market conditions.

After the multi-decade low of just over \$71bn of contract awards in Covid-hit 2020, the market provided some relief by rebounding strongly to almost \$116bn in 2021 as higher oil prices and the resumption of delayed projects helped buoy the industry.

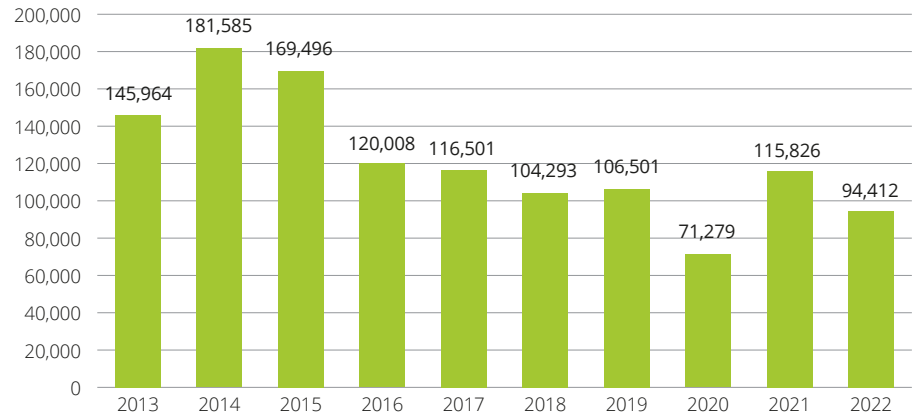
At the start of last year, there was therefore optimism that this recovery would continue. However, this was not the case.

Overall, across the GCC about \$94 billion worth of contracts were awarded in 2022, a year-on-year decline of more than \$20 billion, according to the MEED Projects tracking service. ⁽¹⁾

This has come as a bitter blow for projects companies, many of whom are facing cashflow challenges and a dearth of new opportunities.

Overall, across the GCC about \$94 billion worth of contracts were awarded in 2022, a year-on-year decline of more than \$20 billion, according to the MEED Projects tracking service.

Value of GCC contracts awarded 2013-22 (\$m)



Source: MEED Projects

The cause for last year's contraction is largely attributed to respective 25% and 44% declines in new contracts in the UAE and Qatar. The latter has reduced capital expenditure in recent years in advance of the FIFA World Cup, while the former continues to face ongoing challenges in its real estate sector that have stymied growth.

The one bright spot is Saudi Arabia. With just under \$54 billion worth of contract awards, the Kingdom's projects market is now larger than those in the five other GCC states combined.

Much of this positive performance is down to the acceleration of activity on its five official giga projects – Neom, Roshn, Diriyah Gate, The Red Sea Development, and Qiddiya – as well as other mega developments like Riyadh Sports Boulevard, Jeddah Central and King Salman International Park.

This list has grown longer in the last six months following the launch of the King Salman International Airport project, with an ultimate design capacity to handle 180 million passengers a year, and New Murabba, touted by the government as the world's largest downtown development.

The addition of the two megaprojects has resulted in the estimated capital expenditure of the quasi-government giga and other mega projects to \$879bn, according to MEED Projects.

The one bright spot is Saudi Arabia. With just under \$54 billion worth of contract awards, the Kingdom's projects market is now larger than those in the five other GCC states combined.

The sheer size of this opportunity in Saudi Arabia coupled with declines elsewhere in the region has resulted in many engineering and contracting firms to increasingly turn their focus to the Kingdom.

Yet as the pace of growth in the Saudi projects market accelerates, there is concern that it could overheat as the supply chain races to meet the large requirements for basic materials such as cement and rebar as well as logistical needs like labour accommodation, utilities and plant equipment.

To put it into perspective, the value of contracts awarded on construction megaprojects in the Kingdom more than doubled to \$24.6 billion between 2021 and 2022.

If this rate of acceleration continues, it remains to be seen how these limitations will be overcome.

The adoption of innovative building technology may in part solve these challenges by reducing costs and construction timeframes while improving labour efficiency. Advances in drone, robotics, building information modelling and 3D printing technologies and software have the potential to revolutionise construction as will other strategies such as using prefabricated and modular buildings that enable quicker project delivery.

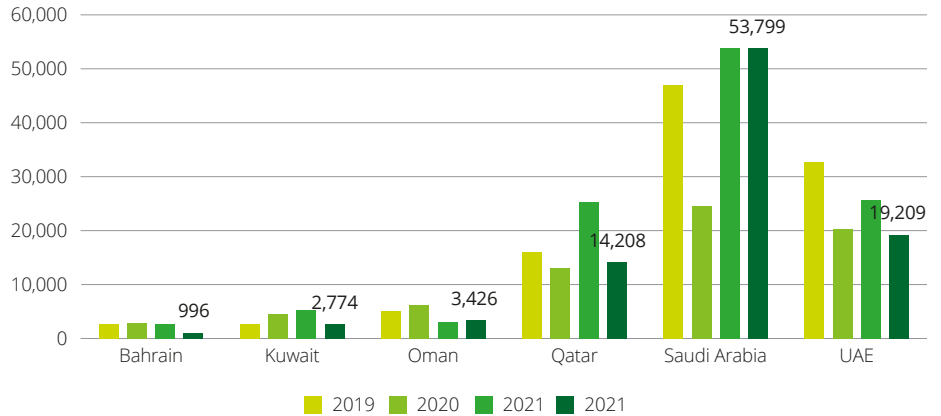
Likewise, the increasing use of procurement approaches hitherto rarely employed in the region, like early contractor involvement (ECI) contracts and master contracting partnerships have the potential to mitigate development risk and increase the number of interested contractors.

The latter is crucial. The investment in February 2023 by the Public Investment Fund investments in four of the Kingdom's largest contractors will help build local capacity but given the size of the task, ahead efforts will also have to be made to attract international firms to help deliver the ambition.

Care will also have to be taken on the environmental impact of future projects. The giga project program has put sustainability at the heart of its procurement processes. Its projects will be powered using renewable energy, while materials will have to meet stringent eco-friendly standards. Only companies which can adapt to these changes will be likely to succeed.

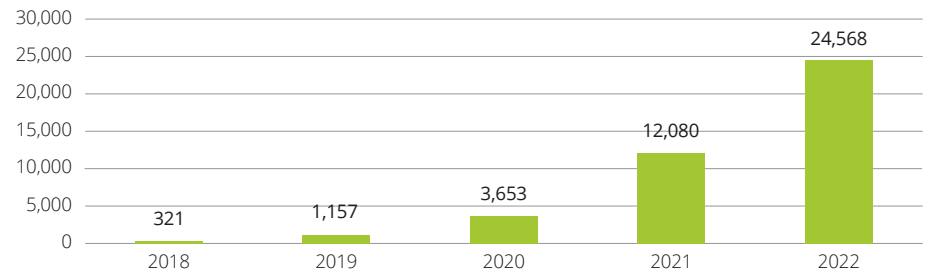
The long-term plans for the Saudi construction sector will fuel the regional projects market over the next decade. The hope is that a new round of

Value of GCC contracts awarded by country, 2019-22 (\$m)



Source: MEED Projects

Total value of giga project and other mega development contracts awarded, 2018-2022 (\$m)



Source: MEED Projects

development in Qatar under its own National 2030 Vision as well as increased oil and gas investments and an expanding real estate market in the UAE will further improve prospects.

As we have seen over the past five years, nothing is certain. But with a \$1 trillion-plus project pipeline and with the right

conditions and preparation, the region is well-placed to succeed. ●

Source:
1. www.meedprojects.com

by **Ed James** | Head of Content & Research, Middle East & Africa | MEED | MEED Projects | GlobalData

The investment in February 2023 by the Public Investment Fund investments in four of the Kingdom's largest contractors will help build local capacity but given the size of the task ahead efforts will also have to be made to attract international firms to help deliver the ambition.

Unlocking the potential - Digital twins and the Metaverse in the construction industry



Despite the recent global publicity, especially following Facebook’s rebranding to Meta, the metaverse is best described as a general term for how virtual worlds can be used for a variety of creative purposes. It is a digital space where users can interact with each other and with virtual objects and environments in a way that simulates the physical world which is a very powerful concept.

A digital twin, on the other hand, is a digital replica of a physical asset, such as a building or a complex infrastructure project. Digital twin technology allows developers, architects, and contractors to optimize the design, reduce errors, and improve the performance of a building. Typically, digital twins are produced for the construction phase of development, to improve cross-disciplinary coordination and as a visualization tool for stakeholders. They are also widely used during building operations to monitor performance, run simulated scenarios, and optimize maintenance.

By no means are these concepts new, but as it relates to the property and construction industries, integrating digital

twins into a metaverse environment is at the forefront. This integration can also produce significant efficiencies throughout the property development lifecycle by extending the useful life of digital twins, all the way from concept design, for use in marketing and sales, through to operations, for maintenance and integration with connected devices, and even through to decommissioning. It opens significant opportunities for the integration of additional technologies as outlined in figure 1.

Additionally, advances in technology and increased investment in the space are leading to greater opportunities for partnership between firms at different stages in the capital project lifecycle. This

leads to improved collaboration, increased engagement of the market and potential customers, and ongoing operational and end user benefits that can help justify the investment in these technologies. This is creating a positive feedback loop of accelerating adoption and implementation within the construction industry, which is notoriously slow at adopting new digital technology, and can be resistant to change.

Engaging customers and stakeholders
Typically, architects, design firms and creative agencies are responsible for the production of conceptual renderings, visuals, and animations of a new project for marketing and sales purposes.

By no means are these concepts new, but as it relates to the property and construction industries, integrating digital twins into a metaverse environment is at the forefront.

Figure 1. Technology maturity spectrum

The metaverse simultaneously draws on many of the below technologies, with almost infinite potential for expansion. As adoption of the metaverse and digital twins increases, integration across technologies will also increase.

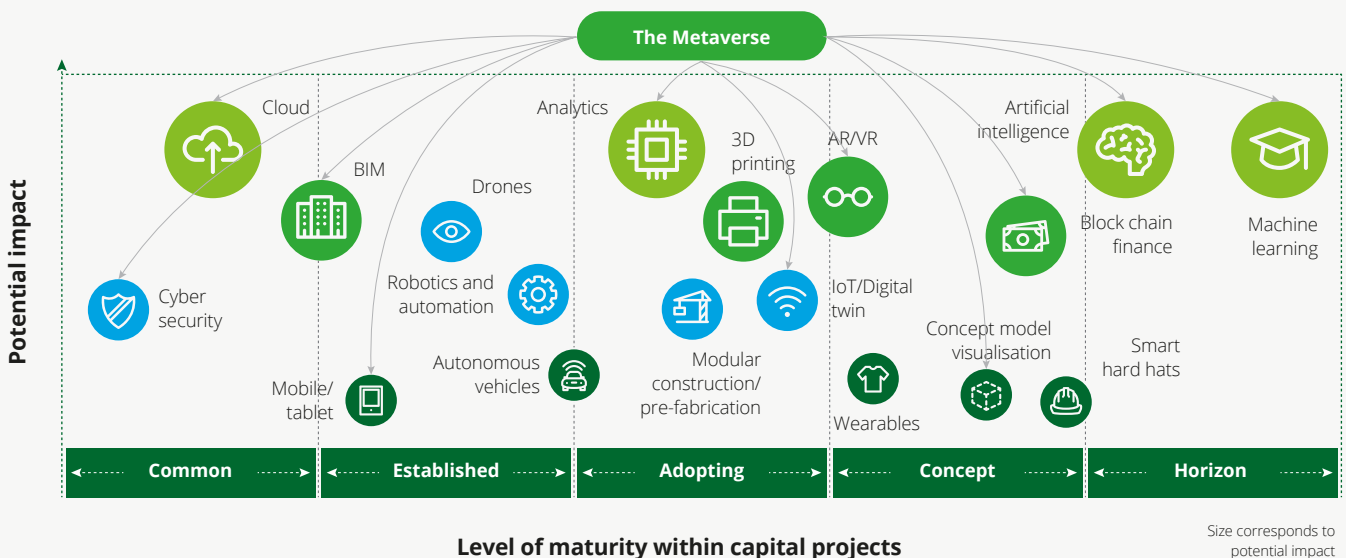
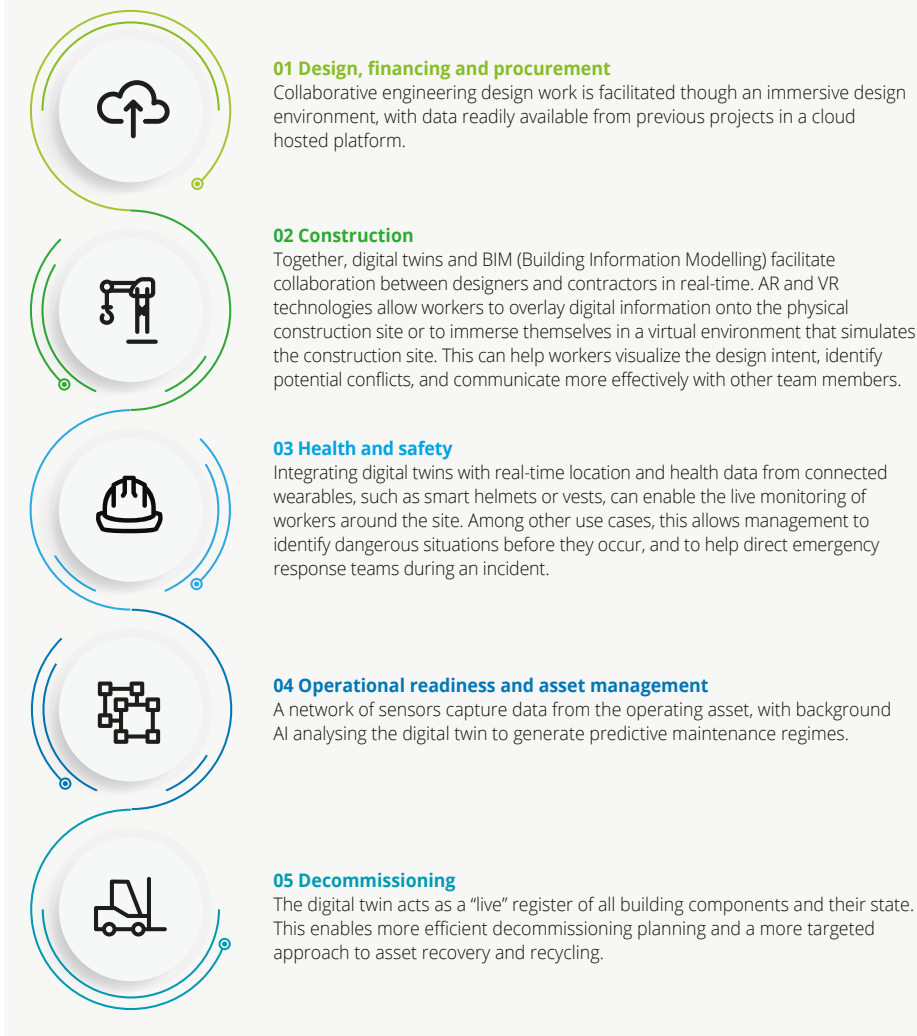


Figure 2. Real-time Collaboration and Feedback



Digital twins can be used to facilitate collaboration between teams working on different aspects of the project, regardless of their physical location.

reducing delays and design clashes, and increasing efficiency.

Digital twins within the metaverse can be used to optimize design based on the end-user experiences, for example, virtual reality walkthroughs of the building, allowing stakeholders to experience the building before it's built. This can be used to showcase the building to potential clients and investors, as well as to train workers on how to navigate the construction site or building safely. This is particularly relevant for assets with very specific operational needs, such as hospitals, where being able to demonstrate designs to users in a near-realistic environment could greatly enhance the feedback and sign-off process.

A living digital asset

Following completion and handover, this same digital twin can be utilized for continuous monitoring and analysis of the building's performance. This can enable the identification of issues in real-time, optimize the operations and maintenance of the building, and reduction of operating costs. Digital twins can be used to simulate different scenarios, such as different layouts and materials, to optimize the operations and maintenance of the building. These examples are very common, especially for oil rigs and manufacturing facilities with extremely high shutdown costs. Additionally, data captured during operations can be used to inform the design of future projects.

These productions offer very little flexibility in terms of re-use despite the high cost. A solution to this is the early development (concept design stage) of a project-wide digital twin. Coupled with recent improvements in photorealistic visualization technology (e.g., Unreal Engine 5), there are almost infinite possibilities for engaging with customers and stakeholders including marketing content creation, virtual, VR, and AR tours, and immersive design experiences. Plus, as design progresses, the level of detail can also increase, bringing stakeholders and customers even closer to the end-product.

As potential customers and stakeholders spend time in the metaverse, similarly to social media, their focus and engagement with different elements of an asset can be monitored and measured. This could open new possibilities for user experience (UX) design, applying principles currently used in the software design world to architecture.

During detailed design and construction, digital twins can be used to facilitate collaboration between teams working on different aspects of the project, regardless of their physical location. Allowing for real-time communication and coordination,

For residential and hospitality assets, the use cases for digital twins and the metaverse extend into device connectivity, security and privacy, and other smart home applications. As these are tangible benefits to the end user, assets with these features can command a price premium that can be charged to customers, compared to those without. Additionally, as these technologies become more common, consumers will begin to expect these features as standard, which will further drive investment in and adoption of these technologies.

Current state of play in the GCC region

Recently, a combination of technological limitations and a lack of tangible ROI has kept digital twins out of the metaverse. Middle Eastern Giga-Projects with enormous budgets and an eagerness to drive technological innovation have helped to bridge this gap. Forward-thinking leaders are seeing the incredible opportunities that a metaverse embedded digital twin can offer, made evident by the recent acceleration of investments in metaverse related ventures.

A notable example is the Kingdom of Saudi Arabia's Public Investment Fund (PIF) recent \$1B commitment to Tonomous (a subsidiary of NEOM) for AI and metaverse projects. Joseph Bradley, Tonomous Chief Executive, has spoken at length on the ambitions

for digital twins at NEOM including their role in improving the experience of future residents. In the UAE, the government recently announced its plans for a "Ministry in the Metaverse", and Dubai's newly developed "Metaverse Strategy" has digital twins as one of its key pillars.

By embedding Digital Twins into the metaverse, asset owners can greatly extend their useful life and unlock integration with a range of other technologies, further enhancing the value of the digital twin and even the asset itself. To take full advantage of this opportunity, it is crucial for leadership to stay up to date with the latest developments in this technology and to dedicate resources to the potential opportunities and risks. ●

Sources:

1. <https://www.neom.com/en-us/newsroom/tonomus-launch>
2. <https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/strategies-plans-and-visions/government-services-and-digital-transformation/dubai-metaverse-strategy>

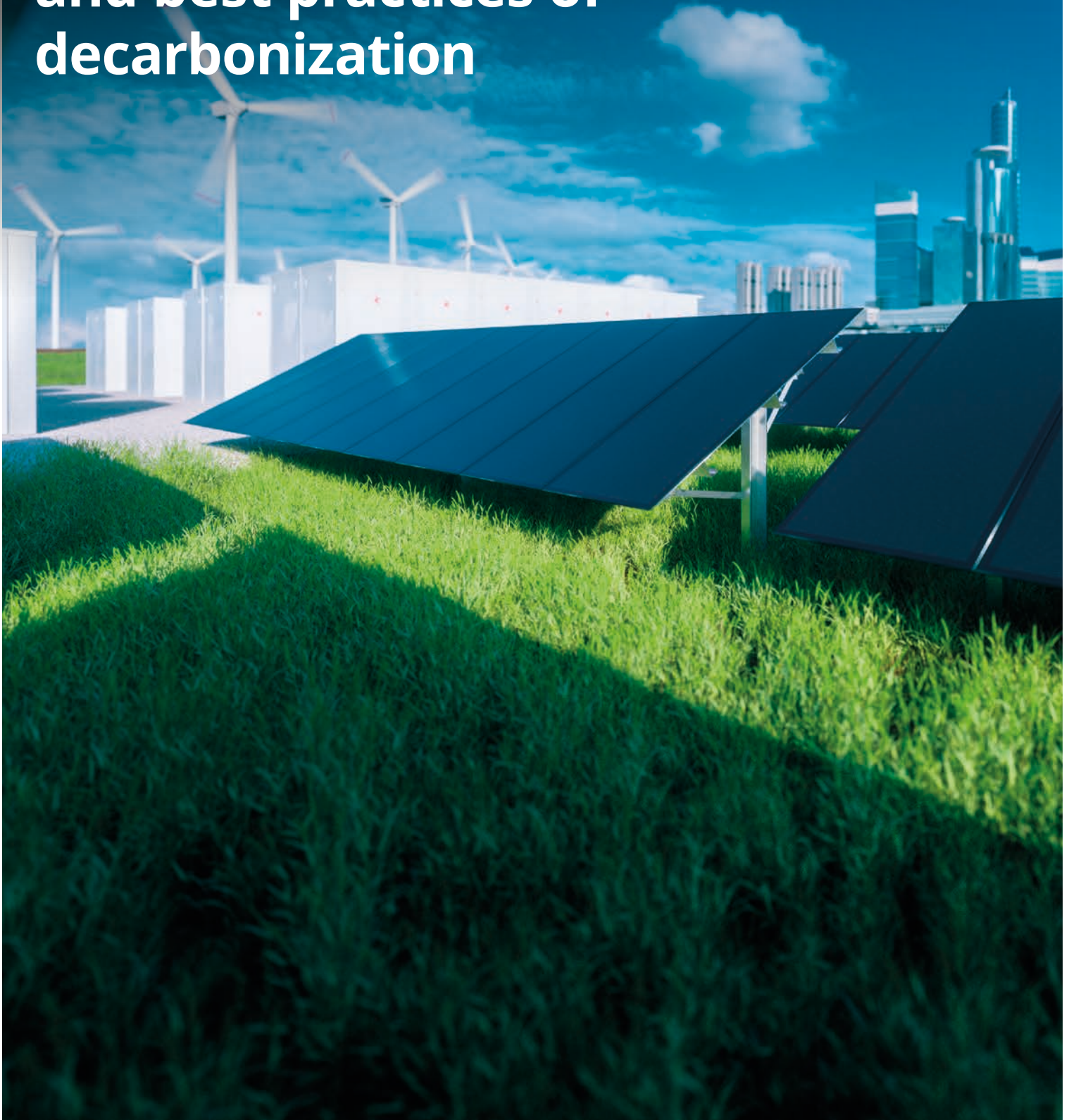
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The construction industry's call to action: addressing the priorities and best practices of decarbonization



Over the past two decades, the construction industry has gone through several key developments, however, two stand out as most significant. Firstly, the long overdue integration of technological innovation and secondly, an increased awareness of the challenges we face when it comes to decarbonization. Positively speaking, the advent of innovation is already serving as a major catalyst towards lowering emissions, however, under the targets set by the Paris Agreement, significant, sector-wide changes will need to be expedited in order to reach our common environmental obligations.

According to current estimates, the global building floor area is expected to double by 2060, meaning an extra 2.4 trillion square feet of new floor area to the global building stock, the equivalent of adding an entire New York City to the world, every month, for 40 years. As a result, the construction sector will continue to account for approximately 40 percent of greenhouse gas (GHG) emissions, with materials, heating, cooling, and lighting being the leading contributors, unless significant changes are implemented.

According to current estimates, the global building floor area is expected to double by 2060, meaning an extra 2.4 trillion square feet of new floor area to the global building stock.

In the UAE, our national leadership has been highly proactive in establishing guidance to support a reduction in emissions as part of its UAE National Net Zero by 2050 Pathway. Under this strategy, the current targets are set to 31 percent

by 2030, 60 percent by 2040 and a 100 percent by 2050, which if successful, will translate into an emission avoidance of 93.2 million metric tons.

At ALEC our approach has been to thoroughly understand the impact of decarbonization before creating a concrete strategy, which is why we are in the process of establishing an emission baseline, which will assess the impact of existing practices on emissions reduction, thereby helping us to develop a model across our operations to estimate GHG emissions. In doing so, our team will be able to create a list of priority mitigation measures, which will be implemented as part of a wider decarbonization framework. As an additional point of comparison, our findings will be benchmarked against the Science Based Targets Initiatives (SBTi) guidance for the buildings sector, which is due in late 2023 and will help to ensure we have planned for the most pressing, sectorial risks.

As one of many forward-thinking organisations in the region, ALEC has engaged in several collaborative opportunities that have yielded optimal results through an increased involvement during the design and build process. Not only has this enabled us to share our expertise with developers and consultants through Early Contractor Involvement (ECI); but forge stronger ties with our preferred suppliers to offer tried and tested, lower-carbon solutions and materials, as well as energy and water efficient systems that support our eco-value engineering solutions. This process has also helped us to reduce our emissions through offsite manufacturing, modularisation, and piloting new low-carbon alternatives.

Based on these experiences, ALEC has reshaped its high-level priorities to focus on more modern methods of construction that optimise productivity, while reducing dependency on unnecessary manpower. This includes switching to clean energy during the construction process to lower dependence on fossil fuels, while optimising the transportation of materials,

people, and waste while supporting the circular economy model by diverting construction waste from landfills.

When it comes to innovation, we are again focusing on supporting the 'Net-Zero' initiative by implementing economically viable mitigation measures such as working with our top tier suppliers to upgrade our reporting framework to capture low-carbon material specifications and Environmental Product Declarations (EPDs). We are also providing a launch pad for testing low-carbon alternatives from local suppliers, where available, as part of our innovation and R&D activities. While many materials will need to be carefully assessed, our initial priority will be concrete and steel, where the construction industry remains responsible for 50 and 30 percent of total demand respectively.

Through the application of BIM and AR/VR tech we are further reducing waste and enhancing efficiency, while upskilling subcontractors by including them in our training programmes. With regular training held for Revizto and Morta, we successfully conducted at least 500 hours of education and training in 2022 alone.

While many materials will need to be carefully assessed, our initial priority will be concrete and steel, where the construction industry remains responsible for 50 and 30 percent of total demand respectively.

In the dynamic business environment, the decarbonization initiative presents a valuable opportunity. The trend we are witnessing is that a rising number of crucial stakeholders are taking proactive measures towards a sustainable future. This is demonstrated by the growing number of procurement opportunities that now require adherence to sustainable principles as a fundamental aspect of their criteria. It is evident that decarbonization is no longer a discretionary matter, but a critical business imperative that requires a collective mind shift.

With the UAE focused on low-carbon alternatives ahead of hosting COP28, particularly secondary raw materials, the country's wider plans for increasing its clean energy mix will only enhance our industry's decarbonization infrastructure, and bring us closer to reaching our collective net zero goals. ●

by **Kez Taylor** | Chief Executive Officer | ALEC

It is evident that decarbonization is no longer a discretionary matter, but a critical business imperative that requires a collective mind shift.

The Whole Life Costing approach to better project outcomes



Whole life costing (WLC) in construction is an approach used to value a building project over its entire lifecycle to give a more complete picture of the total costs. The process involves an assessment of the present value of the total costs associated with a building, including design, construction, maintenance and eventual demolition. WLC is commonly considered by organisations that have a long-term interest in the asset concerned. For example, owners and particularly investors benefit from having a more accurate and comprehensive understanding of the costs of a building or infrastructure project over its life before the commitment to invest. This can create better project outcomes.

Why is Whole Life Costing important?

Before analysing the concept of how WLC benefits asset performance, it is important to understand the broad cost relationship between CAPEX and OPEX. The Royal Academy of Engineering, for example, found that the operational expenditure for a typical commercial office building over a 30-year life would be around five times the original CAPEX. Other studies have indicated that the ratio of five to 10 times capital cost is not uncommon over the projected asset life and this ratio can increase to between 100 to 200¹ for tenant occupiers.

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The benefits case for considering WLC usually falls into five key areas that can be summarised as follows:

1. Improves decision making

WLC provides a more complete picture of the costs associated with a building project, including costs that may not be apparent at the design or construction stage.

2. Sustainability

WLC considers the long-term environmental impact of a building project. This helps to promote sustainability by encouraging the use of materials and construction techniques that have a lower environmental impact.

3. Supports value for money

WLC helps to ensure the best value for money by considering the costs associated with a building project over its entire lifecycle.

4. Supports better planning and budgeting

WLC provides a more accurate picture of the costs associated with a building project, which supports better planning and budgeting. This reduces the risk of cost overruns and ensures that the project is completed within budget. With projects on average experiencing a claim for at least 35% of CAPEX and 68% of originally planned project duration,² this benefit is of extremely high value and often overlooked at the pre-planning stage.

5. Improves operational efficiency

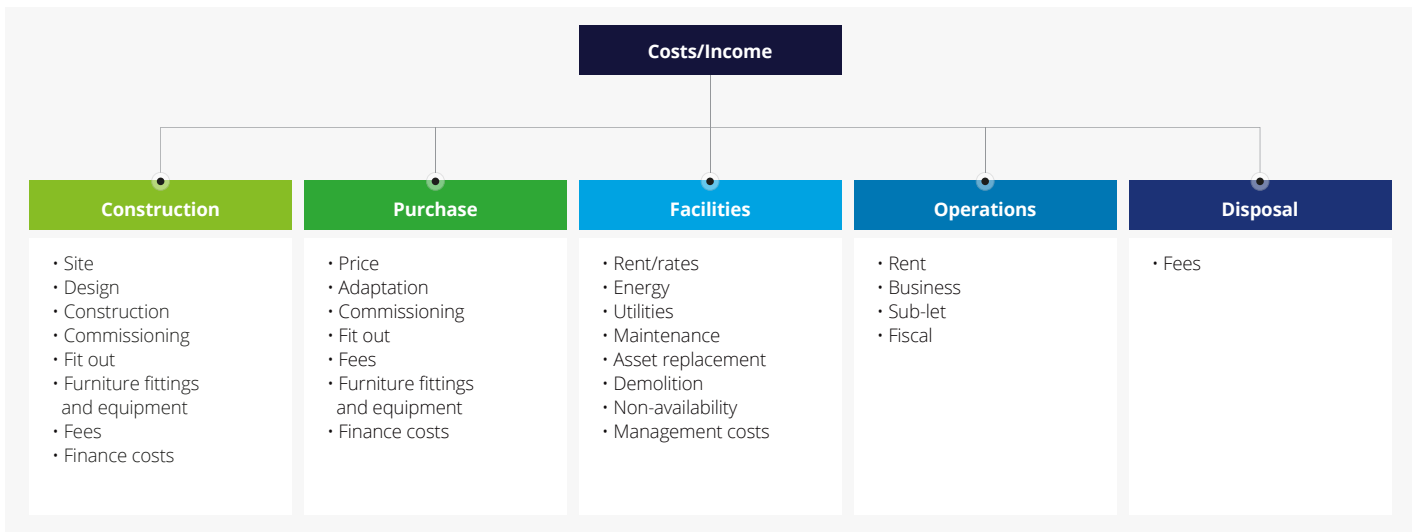
WLC is a vital tool in improving operational efficiency by considering the ongoing costs associated with a building, such as maintenance and energy costs at the design stage – such costs are many multiples of CAPEX and of high importance at the investment stage.

With projects on average experiencing a claim for at least 35% of CAPEX and 68% of originally planned project duration this benefit is of extremely high value.

What costs are considered?

WLC techniques can be used to evaluate options at the elemental, component, and total building levels. At the initial design stage, a whole-life comparison of building refurbishment against demolition and new build would recognise the life-cycle efficiencies of the former and could be crucial to efforts to establish the correct way forward.³

Commercial considerations usually come under five headings that can be arranged broadly as follows:



Costs are associated with a time component and thereby essentially targeting the expenditure at a future date when it is believed that the cost will occur and are expressed in current terms rather than a predicted future value. For example, if a chiller unit is expected to be replaced at year 15, then the current cost of that item is used and assumed to happen in the fifteenth year. The costs are then discounted to create a reporting structure forming a net present value (NPV) of the entire development or, as is often the case in public private partnerships, an equivalent annual amount.

ISO 15686-5⁴ details a standard approach to service planning, which can be accurately audited. The standardised approach to service life planning of construction and infrastructure is vital when comparing asset outcomes and invaluable in portfolio management.

A carbon-conscious future

WLC has traditionally been used as a tool for the investor or portfolio manager. However, there is a growing, and welcome, trend for project owners in all segments and types to use this type of analysis to

improve value in their projects. Yet there is a far broader interest for society at large as the concept of WLC can be extended to include the consideration of carbon as well as commercial cost.

The close cousin of WLC is lifecycle analysis (LCA) as detailed in European Standard EN-15978. This standard specifies the calculation method, based on LCA and other quantified environmental information, to assess the environmental performance of a building. It also provides the means for the reporting and communication of the outcome of the assessment. The standard applies to new and existing buildings and refurbishment projects. While there is a growing understanding that cutting carbon will often also cut WLC, the benefits are far wider. We can now combine the two to create a complete model of assessment that has significant benefits to society and the planet.

In conclusion, WLC is a powerful tool for improving project outcomes in construction. Considering both the commercial **and** carbon costs associated with a building project over its entire

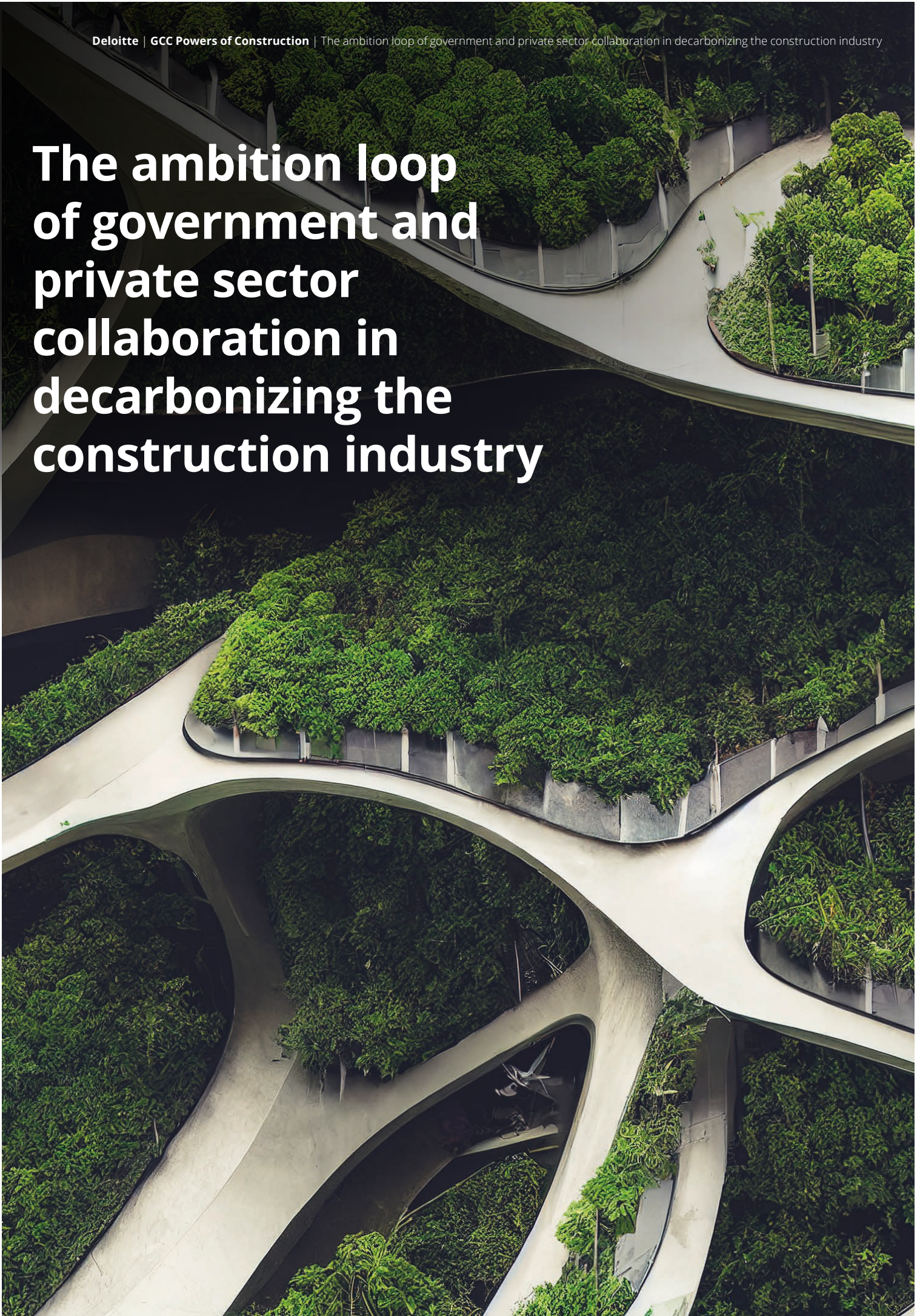
lifecycle has many benefits for project owners – promoting sustainability, supporting value for money, improving operational efficiency, and supporting compliance with regulations. What’s more, it can also assist in our transition to a carbon zero world. ●

Sources:

1. Constructing Excellence – Whole Life Costing 1/4/04
2. HKA CRUX 5th Edition.
3. RICS Whole Life Carbon Assessment for the built environment
4. ISO 15686 – 5:2017 Buildings and Constructed Assets - service life planning

by **Christopher Seymour** | Regional Director and Head of Strategy and Investment MEASA Mott MacDonald, Chair RICS World Regional Board MEA

The ambition loop of government and private sector collaboration in decarbonizing the construction industry



With the recent announcement of the UAE's Net Zero by 2050 Pathway setting out nations ambition to reduce carbon emissions 18% by 2030, 60% by 2040 and 100% by 2050 relative to a 2019 baseline, sustainability is firmly on the strategic agenda of the UAE government and this is mirrored throughout the region, such as with Saudi Arabia's Net Zero by 2060 plans.

Transformative changes are already underway across the public and private sector and include:

- Governments are working towards establishing enabling tools in support of the objectives. This includes updating building regulations, issuing guidelines, providing carbon calculation tools, amongst other measures.
- Developers and contractors are setting ambitious goals to drive sustainability through their internal business transformation by creating resilience, lowering operational costs and creating higher values for stakeholders, investors and customers.
- Investors are considering climate change targets and integrating sustainability (ESG) into their investment principles.
- The industry is forming new partnerships and collaboration models to tackle the challenges across the value chain.

A growing number of businesses have demonstrated their commitment to the sustainability agenda by setting Science-Based Targets (SBT's), publicly announcing Net Zero and ESG targets, or committing to internationally recognized commitments such as the World Green Building Council's Net Zero Carbon Buildings Commitment. As the UAE prepares to host COP28 in November 2023, the opportunity arises for the region to showcase its leadership and drive decarbonization in the construction industry.

However, whilst the construction industry is responsible for almost 40% of global carbon related emissions from fossil fuel combustion, and around 25% of the emissions overall (including operational

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and embodied carbon), it is anticipated that building-related emissions will increase due to urbanisation, lifestyle changes, and the increased need for adequate housing and facilities. According to the UAE Construction Market Report, the construction industry in the UAE is estimated to expand by 3.3% in 2023, supported by the government's continued focus on infrastructure investments. In October 2022, the UAE Cabinet approved AED252.3 billion of investments for the next three years. While the construction market is growing, there is an urgent need to reduce the overall carbon footprint from new development projects.

Developers and contractors are catching up to the climate crisis quickly and already driving the change, however, the climate change agenda must be driven collaboratively, by industry partnerships, technology innovation, and government support.

To decarbonise the construction industry, we must take a look from a development lifecycle perspective: from design and procurement, construction, operations and end-of- lifecycle.

As there are many players involved in the development lifecycle, it becomes crucial to undergo a culture change within project financing to enable prioritisation of sustainability. It starts with the project

designers integrating sustainability principles such as efficient space utilisation, low carbon materials for buildings and infrastructure, efficient design of building envelope, MEP components and renewable energy into the early stages of a development project. This should be followed by feasibility studies to acquire budgetary sign-offs and ensure sustainability targets are part of the project development.

A new challenge arises during the process of aligning the project requirements with the supplier's "net zero maturity" levels. Nowadays, there is still a lack of visibility into suppliers' sustainability processes and availability of low carbon materials and technological solutions in the local markets.

There is a unique opportunity for procurement leaders to influence the impact of the organisations on a large scale. The data blind spots exist within the supply chain and it is impacting the construction procurement narrative. Leveraging the climate urgency with the sustainable design of a procurement systems, developers can influence the suppliers / contractors to consider different business models taking into account service / products carbon emission life-cycle (as an example transitioning to a product-as-a-service model where developers pay for equipment by hours of use which can positively impact the electricity used at the construction site).

The climate change agenda must be driven collaboratively, by industry partnerships, technology innovation, and government support.

A pure top-down approach in the supply chain might have its own challenges. We need a multi-level approach by engaging a critical mass of construction companies in their supply chain, supported by government efforts to achieve large-scale change.

In light of all these opportunities, policymakers at all levels of governance are also increasing their efforts to respond to the challenges. It is certain that the climate crisis itself is often a motivator of change (as the Covid-19 crisis has shown).

The UAE government has developed a number of policies in support of sustainability in the construction industry. Some of them are listed below:

- Dubai's Green Building Rating System (Al Safat)
- Dubai Building Code - integrating some of the sustainability principles
- Abu Dhabi Pearl Rating System (Estidama)
- Ras Al Khaimah's Green Building Regulation (Barjeel) & Green Public Procurement Guidelines
- Green financing schemes (e.g. Sukuk, Green Bonds, Energy Performance Contracting) to provide incentives for sustainable development

It is anticipated that many more enabling tools will come into effect providing a driver for businesses to disclose their sustainability performance. However many local businesses are going further and developing their own Net Zero tools. Collaborative leadership at all levels of government is essential to steer us towards Net Zero targets and support the private sector challenges.

What is needed to decarbonise the construction industry:

1. Mutually beneficial strategies

All players across the construction value chain will need to understand where they currently stand before drafting the journey of where they want to be. By understanding what is their current carbon footprint and impact on the environment, they will be able to identify interventions to reduce the impact. Once the interventions are drafted, the value-chain players will be able to identify areas of collaboration and co-create the delivery of sustainable projects together with designers, architects, suppliers, contractors and government.

The initial part of this journey is the creation of a collaborative platform across the project value-chain to raise awareness, build capabilities, share CAPEX, risks and opportunities of mutual actions towards individual net zero goals.

2. Enabling regulations and technologies

Governmental support to enable the net zero transition in construction is important when it comes to setting the minimum sustainability requirements to development projects, renewable energy and scaling up the new technologies. In the coming period, we will be witnessing the significant investments towards decarbonization technologies (low-carbon additives

to building materials, hydrogen use in steel production and construction activities, carbon capture and storage in manufacturing). This can facilitate the adoption of and help grow the market to achieve the necessary scale. The regulations should be drafted to support the change.

3. Collaboration and leadership

Changing the "business as usual" is not an easy task for governments nor the private sector. Financial barriers are often referred to as the main reason for failing to implement decarbonization strategies in construction. When viewed in isolation, the scale up of the capital investments can be overwhelming, however in the context of a local GDP or countries investment plans, another picture emerges. By having a collaborative approach, businesses, governments and investors have a key role to mitigating risks, boosting financial systems and encouraging innovation.

Accelerating the construction industry decarbonization clearly depends on a multi-level approach and collaboration. The governments should act as catalysts of change, providing direction for the economy, financial institutions as a fuel for change, while the construction value-chain collaboration is the vital engine driving the agenda forward. ●

by **Tamara Bajic** | Associate Director, Strategy and Advisory | AESG

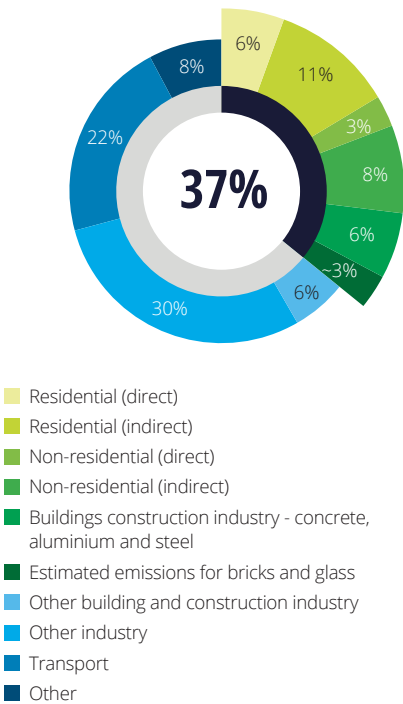
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Shining GreenLight on the construction industry



In the 2022 Global Status Report for Buildings and Construction, the United Nations stated that “Buildings and the construction sector are not on track to achieve decarbonization by 2050.” The report¹ highlights the various challenges that the property and construction industry have faced since the Global pandemic in 2020. In addition to an economic slowdown, companies were shut down due to the lockdown. Furthermore, a global labour and material shortages and a significant increase in energy prices were witnessed in Europe. In 2021, the buildings and construction sector accounted for around 37% of energy- and process-related CO₂ emissions and over 34% of energy demand globally.

Figure 1: Global share of buildings and construction operational and process CO₂ emissions, 2021



The Middle East, more specifically Saudi Arabia, is investing heavily in capital projects such as Neom, Red Sea Global, ROSHN and various downtown development projects. Moreover, the region has played host to major events; notably the FIFA World Cup in Qatar, Expo 2020 in the United Arab Emirates and COP28 which will be hosted in 2023 at Expo City in Dubai.

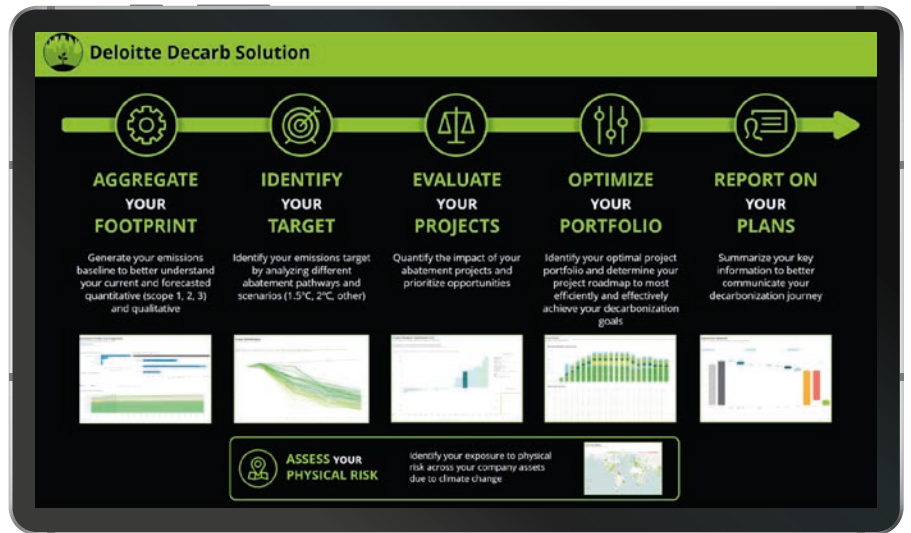
These international events, which gain millions of visitors, gave rise to interesting dynamics in the region as they attempt to fulfill the UAE, Saudi Arabia, and several Middle Eastern countries’ visions for the future. These visions include growth and development objectives for the region as well as governments commitments to achieving Net Zero emissions by 2050 for Oman and the UAE or by 2060 for the Kingdom of Saudi Arabia, Kuwait, and Bahrain.

Embedded carbon, which stems from construction materials used in the region, has one of the highest rates of carbon

emissions in the industry and is therefore the hardest to abate in the Middle East. Indeed, new innovative technologies and supply chain solutions would allow companies to mitigate and minimize carbon emissions.

As the world attempts to recover from the pandemic and plan for the upcoming global recession by carefully allocating capital and resources, we have found that there needs greater clarity on how to decarbonize giga-projects and large infrastructure projects, while planning capital expenditure over the next 30-40 years. Deloitte has therefore developed a set of tools that aim to help industries shine light (or rather, ‘GreenLight’) on how to decarbonize one of the most energy intensive industries on the planet.

Data integrity and collection in both the construction and operational phase is key with current levels of data integrity and reporting of Scope 3 (indirect emissions such as embedded carbon, supply chain emissions and waste) significantly lower



In the 2022 Global Status Report for Buildings and Construction, the United Nations stated that “Buildings and the construction sector are not on track to achieve decarbonization by 2050.”

than global levels. This solution allows you to digitize your decarbonization approach by providing a data-driven platform to build and communicate your strategy to internal and external stakeholders. It also builds your end-to-end company emissions profile, including historical and future emissions based on production schedules, capital profile and the growth prediction for your organization.

The Decarb Solution relies on leading scientific information and methodologies, including the Intergovernmental Panel on Climate Change (IPCC) RCP pathways, the International Institute for Applied Systems Analysis (IIASA) Shared Socio-Economic scenarios, and the Science-Based Target (SBT) methodologies. Relying on these methodologies allows the industry to draw scientifically based and accurate abatement pathways to help define your strategic objectives and decarbonization goals which will bolster the level of transparency and reliability in the construction sector. The pathway to decarbonization and the goal to meet net zero will only be achieved if we rely on science-based methodologies. To attain your objectives, our GreenLight tool takes into account emissions from materials, supply chains as well as assets' end of life.

The pathway to decarbonization and the goal to meet net zero will only be achieved if we rely on science-based methodologies.

During the master planning and city strategy process, it is often asked "how much will it cost to decarbonize?" These questions need to be considered during the development process, in the future capital allocation process and during the optimization process. We take your strategic direction and prioritization of abatement projects opportunities by enabling you to calculate and visualize the NPV (Net Present Value) of abatement projects. GreenLight, will help you to identify an optimized portfolio of abatement projects, with delivery schedules based on financial constraints to create your emission reduction roadmap.

Finally, the tool assists clients with various global reporting requirements such as the Task Force on Climate Related Financial Disclosures (TCFD) and the various Sustainability reporting frameworks such as the Global Reporting Initiative (GRI). Our GreenLight tool is an efficient digital solution which can help the construction industry capture all emissions across your value chain, establish science based and verified reduction pathways, assess the various abatement projects and capital allocation processes, and plan and report to various external and internal stakeholders on your progress.

The Middle East and its leaders have committed to attain several global initiatives such as achieving Net Zero and adhering to the Sustainable Development Goals (SDGs). Everyone has an active role to play - including construction companies. ●

Source:

1. <https://www.unep.org/resources/publication/2022-global-status-report-buildings-and-construction>

by **Daniel Gribbin** | Director, Climate & Sustainability | Risk Advisory | Deloitte Middle East

The Middle East and its leaders have committed to attain several global initiatives such as achieving Net Zero and adhering to the Sustainable Development Goals (SDGs). Everyone has an active role to play - including construction companies.

Implementing the Living Master Plan



As recent years have shown, real estate markets often evolve more rapidly than market analysis and concept development can keep up with. The iterative process of highest and best use analysis combined with master planning requires closer integration and digital tools are supporting this transition.

As market conditions, technologies, and policy continue to evolve, the only certainty is change. This change must be accounted for in urban design when planning for future resilience.

Master planning focuses on existing market gaps and future requirements. To this end, master plans of the future must have the ability to cater for multiple scenarios, capture key project success criteria, and adapt to changes in the industry.

A real-time, iterative approach to master planning leverages generative design to allow developers and stakeholders

to be dynamic in decision making and harmonious in action.

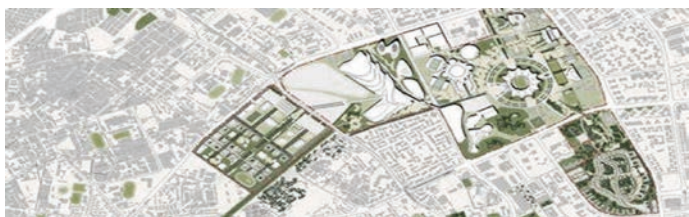
The **Living Master Plan** validates design choices and reprioritizes success factors over time, de-risking developments and ensuring the design is appropriate. The Living Master Plan can seamlessly factor in site constraints, quality of life metrics, financial outcomes and project program, while generating architectural building typologies.

Enabling an Integrated approach

An integrated approach to master planning helps monitor, track and maintain the key performance indicators (KPIs) that are most aligned to development success over time, while identifying areas of opportunity where modifications to design is required to ensure that the right choices are made at the right time.

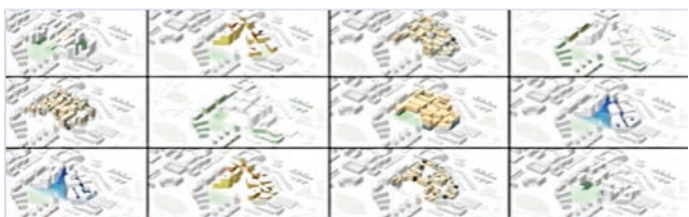
Using the power of data analytics and Artificial Intelligence (AI) allows developers to generate hundreds of options for a site based on priority outcomes and financial metrics; what used to take months, can now just take a matter of days.

The traditional master plan



Single design at a fixed point in time. Difficult and expensive to change or model financial outcomes. Often out of date before the project is complete. Siloed from cost benefit analysis, development data, and quality of life metrics.

The Living Master Plan



Deloitte, using Delve software by Google, has developed an approach that ensures the required data is captured in the right way to deliver a holistic, quantitative, and transparent urban design. The integrated approach allows transformation of development recommendations into the project's physical-and-digital blueprint to guide developers, architects, and engineers, as well as create a digital asset for operations.

Source: Deloitte, powered by Delve software

The use of AI for master planning allows developers to fine-tune the criteria for success across the entire project lifecycle.

Stakeholders can make quicker decisions on what to keep, what to change, what to remove. Any changes that are needed can be iterated quickly, including over time as the market evolves – allowing stakeholders to validate if the design is still fit for purpose and feasible.

Every single design option can also be integrated with a financial model,

customised to a project. The impact of different building designs, program mixes, and unit sizes on project returns can be readily available for assessment. ESG metrics can also be incorporated in addition to calculating public realm operating and lifecycle costs.

The AI supported development process provides an iterative and collaborative tool for decision making through:

- 1. Early-stage analysis:** Evaluation of potential risks through multiple scenario testing.
- 2. Faster decision making:** Complex design processes can be augmented with machine learning to reduce processing time.
- 3. Shortlisting of optimal designs:** Multiple factors impacting the development scheme can be tested in a short space of time.

4. Financial impact review: Financial outcomes for varied design options can be compared simultaneously providing a snapshot of expected profitability.

5. Digitalised asset information: The initial development process can be integrated with market data and wider digital strategy to unlock the power of the digital twin.

6. Design for future asset management/operations state: User journey design can be evaluated for future operational stage involving digital services and planned revenue diversification. ●

by **Oliver Morgan** | Partner, Real Estate Development | Deloitte Middle East

Manika Dhama | Director, Real Estate Development | Deloitte Middle East

Marco Macagnano | Senior Manager, Digital Real Estate Leader | Deloitte Financial Advisory, Canada

Sample output

Riyadh Site

Site Land Area
281,034.6 sq m

Riyadh Site

Parcel Area: **281,035 sq m**
 Max Floor Area Ratio (FAR): **4.0**
 Max Height: **40m**
 Min Open Space Ratio (OSR): **40%**

Program

- Hotel
- Office
- Retail
- Parking
- Community
- Educational
- Medical
- Residential
- Service Apartments



Metrics

Design 30

- Hotel
- Office
- Retail
- Parking
- Community
- Educational
- Medical
- Residential
- Service Apartments

Quality of Life

Design 30

- Hotel
- Office
- Retail
- Parking
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<p>Design 30</p> <table border="0"> <tr><td>Total GFA</td><td>1,124,000 sq m</td></tr> <tr><td>Hotel GFA</td><td>100,000 sq m</td></tr> <tr><td>Office GFA</td><td>400,000 sq m</td></tr> <tr><td>Retail GFA</td><td>100,000 sq m</td></tr> <tr><td>Parking GFA</td><td>200,000 sq m</td></tr> <tr><td>Community GFA</td><td>100,000 sq m</td></tr> <tr><td>Educational GFA</td><td>100,000 sq m</td></tr> <tr><td>Medical GFA</td><td>100,000 sq m</td></tr> <tr><td>Residential GFA</td><td>100,000 sq m</td></tr> <tr><td>Service Apartments GFA</td><td>100,000 sq m</td></tr> <tr><td>Total Program GFA</td><td>894,500 sq m</td></tr> </table>	Total GFA	1,124,000 sq m	Hotel GFA	100,000 sq m	Office GFA	400,000 sq m	Retail GFA	100,000 sq m	Parking GFA	200,000 sq m	Community GFA	100,000 sq m	Educational GFA	100,000 sq m	Medical GFA	100,000 sq m	Residential GFA	100,000 sq m	Service Apartments GFA	100,000 sq m	Total Program GFA	894,500 sq m	<p>Design 30</p> <p>Quality of Life Metrics</p> <table border="0"> <tr><td>Walkability Score</td><td>85%</td></tr> <tr><td>Public Transport</td><td>90%</td></tr> <tr><td>Green Space</td><td>40%</td></tr> <tr><td>Healthcare Access</td><td>95%</td></tr> <tr><td>Educational Access</td><td>90%</td></tr> <tr><td>Community Amenities</td><td>80%</td></tr> </table>	Walkability Score	85%	Public Transport	90%	Green Space	40%	Healthcare Access	95%	Educational Access	90%	Community Amenities	80%	<p>Design 30</p> <table border="0"> <tr><td>Walkability Score</td><td>85%</td></tr> <tr><td>Public Transport</td><td>90%</td></tr> <tr><td>Green Space</td><td>40%</td></tr> <tr><td>Healthcare Access</td><td>95%</td></tr> <tr><td>Educational Access</td><td>90%</td></tr> <tr><td>Community Amenities</td><td>80%</td></tr> </table>	Walkability Score	85%	Public Transport	90%	Green Space	40%	Healthcare Access	95%	Educational Access	90%	Community Amenities	80%
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Source: Deloitte, powered by Delve software

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The UK construction playbook - a blueprint for a more sustainable construction industry globally?



In December 2020 the UK Government published the first edition of the Construction Playbook, mandated for use on all public works projects and programmes (including building, civil engineering, construction, and equipment projects) carried out by central government and arms-length bodies.

The Construction Playbook was instigated following successful implementation of the Outsourcing Playbook in February 2019, which sought to address how government interacted with private companies following the demise of Carillion. The UK Government hopes the Construction Playbook will support its plan to deliver large scale infrastructure projects and programmes across the UK better, faster, and greener.

The Playbook was developed through collaboration between government representatives, specialist industry bodies and the industry itself which comprised construction companies, material suppliers and consultants. The Government's ambition is to leverage the significant pipeline of capital spend over the next decade to drive positive change within the construction sector, developing policies which encourage long term relationships and offering reward for delivering improved value.

The Playbook is ambitious in its intent, and the 14 key policies included cover the full lifecycle of a project or programme from setting strategic direction to handover for operation. The policies are intended to drive improved safety within the industry, take strides to deliver the UK's commitment to net zero carbon by 2050, and to promote social value.

Following launch of the first edition, the government published an updated version in September 2022. The update contains several guidance notes on selected topics which were also developed in collaboration with industry, arguably the most important being 'Promoting Net Zero Carbon and Sustainability in Construction'.

The Playbook was developed through collaboration between government representatives, specialist industry bodies and the industry itself which comprised construction companies, material suppliers and consultants.

Whilst the Construction Playbook is a UK Government publication, the themes and challenges it seeks to address are not unique to the UK Construction sector, far from it. Whilst other countries or regions have different economic factors, ways of working, cultures, and political landscapes influencing local policy, the requirement for the construction sector globally to improve, innovate and become more sustainable is consistent. Other governments should decide how they can follow in the UK's footsteps.

Which initiatives within the Playbook might be considered a blueprint which could be adopted by other countries when specifically considering how to drive sustainability within industry, particularly relevant as COP28 approaches at the end of 2023? Here are two key areas we think are directly relevant and can apply across different geographies:

1. Early engagement of supply chain/ Whole life assessment

Early engagement between clients and supply chain partners is often promoted and if successful can lead to a wide range of benefits, such as agreement of value drivers, appropriate risk transfer, improved design solutions and ultimately reduced costs and delivery timescales. However, in seeking to address one of the most significant challenges of increased sustainability and striving for net zero, a commitment to early engagement across projects or programmes can help challenge the tried and tested and drive the innovation needed.

Changing how we assess projects to consider the whole life impact including carbon impact will also be critical in achieving net zero commitments and will rely on early involvement of supply chain partners. 'Should Cost Modelling' is a central theme across several of the Playbook's policies, making it a mandatory requirement for government clients to assess what the asset 'should cost' over the expected design life. This will encourage value-based decisions over the asset life rather than cost-based decisions considering the build period only. In parallel with Should Cost Modelling, whole life carbon assessments are mandatory throughout design and tender stages. Solutions proposed by suppliers must be accompanied by a whole life carbon assessment to encourage decisions which minimize the impact on Greenhouse Gas Emissions (GHG).

2. An outcome-based approach

The policies in the Playbook have been developed to help specific contracting entities develop a set of clear objectives, priorities and specifications at a project level and ensuring they reflect overall government strategic priorities. The guidance includes a suite of 'tools' to assist project teams in embedding specific sustainability requirements throughout a project lifecycle including the design, setting the delivery model and the key criteria and weighting used to score bids at tender stage.

A clear set of objectives which meet the requirements and specification of a client is key to the success of any project,

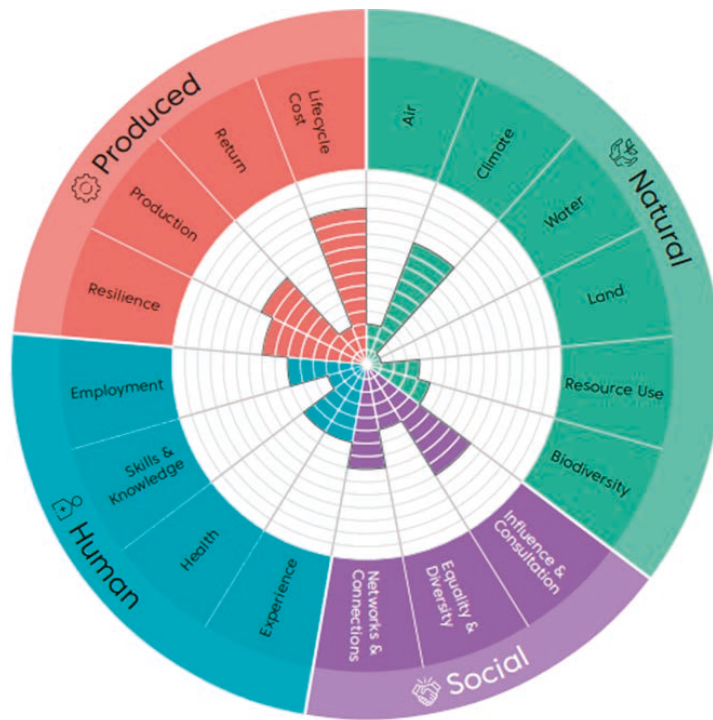
whilst giving suppliers the ability to offer their own solutions and innovate. The Playbook states that an outcome-based approach should be adopted by clients which must focus on the 'whole life value' of an asset and a set of clear and measurable objectives developed to suit. This will allow clients to better assess how individual projects are contributing to wider economic, social and environmental targets. The Project/ Programme Outcome Profile tool (Previously Project scorecards) has been introduced which supports clients in setting these outcomes, using the value definition framework (see image).

Whilst the Construction Playbook was developed by the UK government, the themes and challenges it is seeking to address are common in other countries and regions globally, particularly what industry needs to do to address sustainability and meet the commitments for achieving net zero. On this basis it would seem sensible that other governments consider the policies of the Playbook, in whole or part as a blueprint for developing their own guidance or legislation. ●

Sources:

1. The Construction Playbook - GOV.UK
2. Promoting Net Zero Carbon and Sustainability in Construction – GOV.UK
3. Construction Innovation Hub, Value Toolkit Overview April 2021

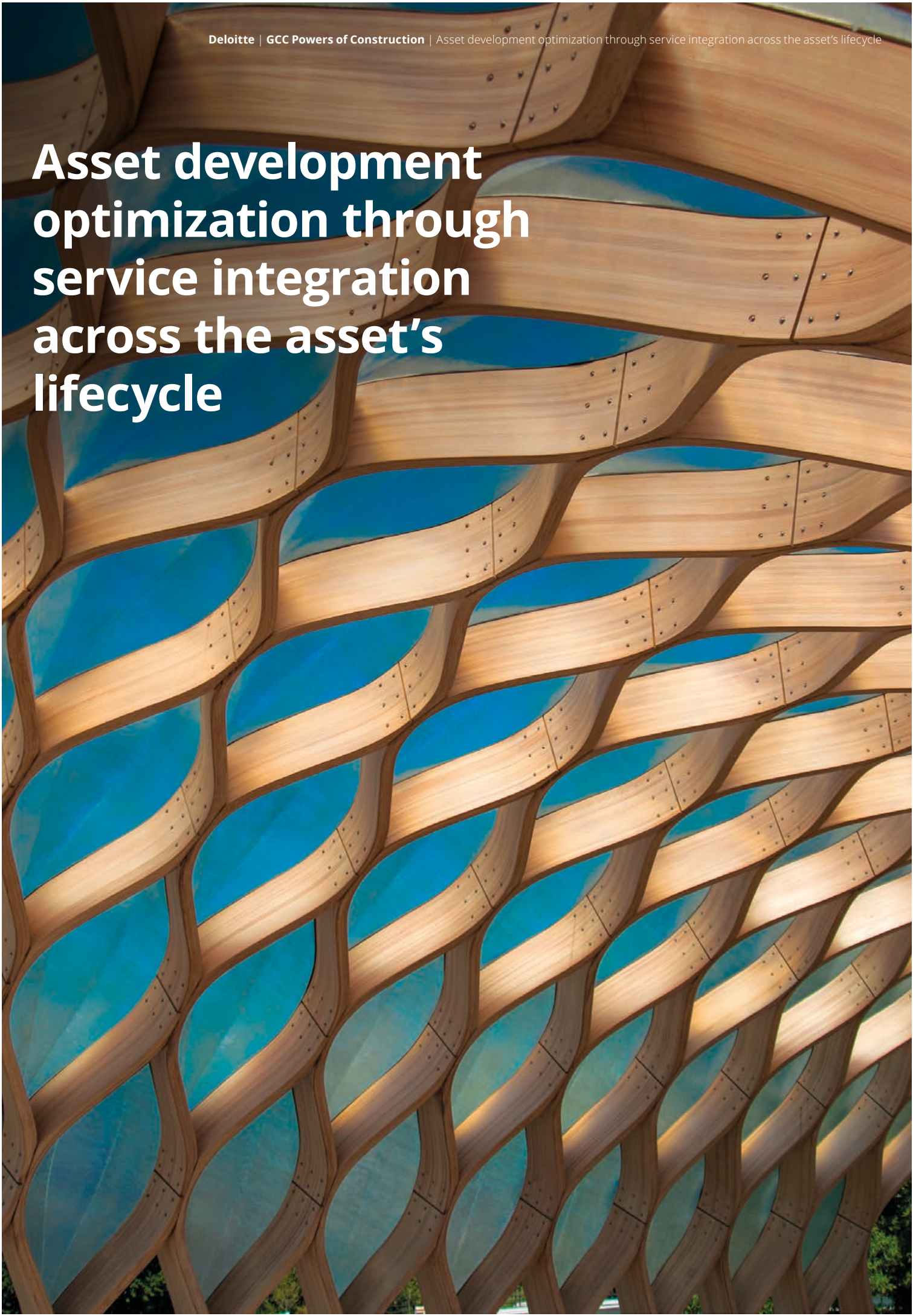
by **Dan Gregory** | Director, Real Assets Advisory | Deloitte UK



Source: Construction Innovation Hub, Value Toolkit Overview April 2021

The Playbook states that an outcome-based approach should be adopted by clients which must focus on the 'whole life value' of an asset and a set of clear and measurable objectives developed to suit.

Asset development optimization through service integration across the asset's lifecycle



Introduction

Achieving delivery optimization is a key objective of any capital asset development program; however, it is a challenging task due to the complexity of activities involved throughout the asset development lifecycle; and more often than not, capital assets are affected by budget overruns, asset handover delays, contractual disputes, and operational inefficiencies that prevent them from accomplishing their optimization goals.

A common cause is the mismatch of multidisciplinary technical and commercial solutions which are developed in isolation instead of incorporating their outcomes into an integrated solution. This usually brings difficulties to the capital asset development, particularly during construction and operation.

An overview of the inter-relationship across the capital asset development phases and key considerations to achieving optimizations throughout the asset lifecycle are presented next.

Understanding the infrastructure lifecycle and the interrelation across its development phases

Firstly, it is important to understand what the stages of the capital asset lifecycle are. There are several definitions, but for the purpose of this assessment, a conventional 4 stage cycle will be defined comprising of Initiation and Planning, Transaction and Procurement, Design and Execution, and Asset in Operation. To these steps, a Decommissioning or Asset Closure stage could be included, but this article will focus on the interrelationship of these 4 key stages.

Secondly, an overview of the objectives and key activities involved in each step of the capital asset development cycle is presented. During the Initiation and Planning stage, the feasibility of the capital project is determined by the outcomes of preliminary technical, commercial, and financial assessments. After the project is considered feasible more level of detail is developed technically, through a Master

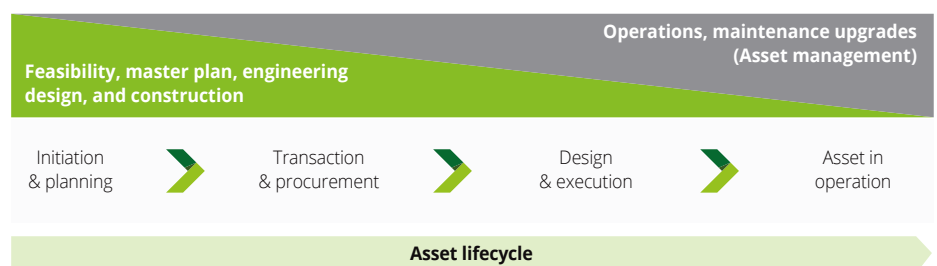
Plan and Front-End Engineering Design (FEED); and commercially, through the completion of the capital project Business Case. With these outputs, the project progresses into the Transaction and Procurement phase which focuses on determining a suitable procurement model, estimating the project finance (i.e., project cash flows, CAPEX, OPEX, and key financial metrics), and obtaining funding to secure the execution and initial operation of the asset, while further detail on the technical and operational aspects of the project continue to be developed. The next stage is the Design and Execution of the capital asset. Here the engineering design and project execution plan are developed, and with the assistance of project management and cost control frameworks, they guide the asset execution until handover and start of the Asset in Operation stage. This last stage implements the project technical and operational specifications previously developed, in addition to the defined asset management systems.

With a clear idea of the development stages involved in the capital asset lifecycle, a better understanding of their interrelation can be achieved. The critical objective in an optimized asset development is to achieve efficiencies during the asset's execution and operation. This is only possible if optimal solutions have been considered from the initial stages of the asset development lifecycle. In this regard, considerations on the asset's operation should be included since project

initiation and gradually increase its inputs as the project progresses into the design and execution stages until the asset's handover and start of operations. Similarly, the technical aspects of the project (i.e., engineering solutions) are crucial at the initial stages, and should continue to develop and be optimized throughout the asset lifecycle, including the Asset in Operation stage. Figure 1 illustrates this relationship.

The critical objective in an optimized asset development is to achieve efficiencies during the asset's execution and operation. This is only possible if optimal solutions have been considered from the initial stages of the asset development lifecycle.

Figure 1. Interrelation of technical and operational aspects across the capital asset lifecycle



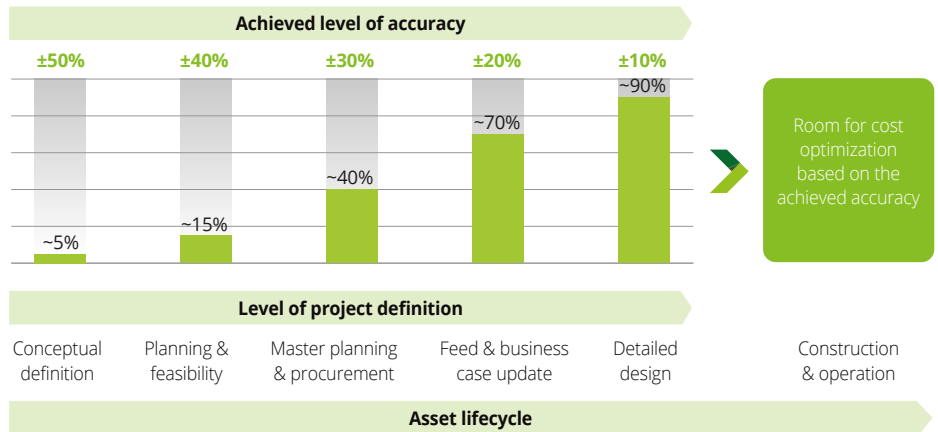
How can asset development optimization be achieved?

There are numerous ways to achieving optimized solutions, they all depend on the nature of the asset, the systems and technologies available, the experience and skill of the team, and collaboration between stakeholders with a common vision and aligned objectives. In this section, a few of these potential solutions that could positively contribute to achieving optimizations during the capital asset development are outlined.

- 1. Obtain inputs from multidisciplinary specialists:** Since project initiation with the objective of capturing important details related to the execution and operation of the capital asset critical to a successful asset development. This facilitates the identification and implementation of potential optimization options during the asset lifecycle.
- 2. Applying the right methodology to improve accuracy throughout project development and translate this accuracy into budget estimation:** A common challenge is the realization of underestimated budgets during construction, which results in budget overruns. With the right specialist inputs and budget estimations from project initiation, cost efficiencies can be achieved as the accuracy of calculations improves and the level of project definition increases. Figure 2 illustrates how the accuracy should improve in relation to the level of project definition (source: AACE International Recommended Practices).

Note that there is a minimum level of accuracy to be targeted during the asset development cycle, even at initiation; hence the importance of appointing the right specialist at the preliminary stages of the project, as following this trend should translate in cost reductions as a consequence of increasing accuracy and project definition instead of budget underestimation.

Figure 2. Level of accuracy in relation to asset definition

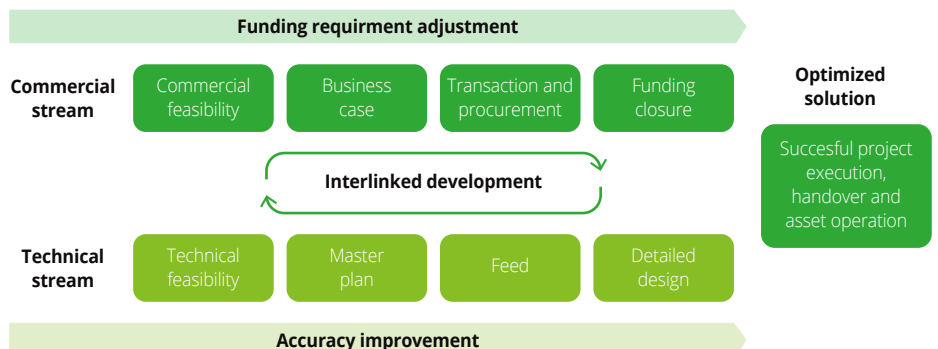


Source: AACE International Recommended Practices

- 3. Understanding the sequence of capital assets development:** Planning the sequence of works is key to achieving delivery efficiencies and cost reductions, which also facilitates obtaining funding. Understanding, with a reasonable level of accuracy, the project funding needs for the upcoming 6 to 12 months can ease the funding eligibility requirements and facilitate a more efficient capital allocation.
- 4. Synergies between the commercial and technical aspects of capital assets development are crucial to achieving cost and delivery optimization:** The capital asset enters into two development streams, a commercial stream which focuses

on defining the commercial feasibility and business case, the transaction and procurement strategy, and securing funding for the project; and a technical stream which diverts into the completion of the technical feasibility, master plan and FEED, followed by the detailed engineering design entering to project execution and operation. The progress of each element of the technical stream should feed the commercial stream, and the outcomes achieved in the commercial stream should be incorporated into the technical solutions. Figure 3 illustrates this dynamic and the diversion of technical and commercial aspects during the asset development lifecycle. Achieving funding requirement adjustments while improving accuracy

Figure 3. Diversion of technical and commercial development streams and interaction between development stages



of technical aspects should represent a good scenario to achieving cost optimization across the asset development stages.

5. Defining an efficient and comprehensive management, scheduling, and cost monitoring framework:

The management framework should comprise of three levels. Portfolio management, focusing on achieving client objectives, program management, focusing on accomplishing the development vision, and project management, focusing on the successful delivery of the project. This approach is evident for large infrastructure development entities with a portfolio of capital programs and projects; however, it can be applied to any development scale. In simple words, the management framework should incorporate the investor's interest, the overall project objectives, and tasks delivery accomplishment. The scheduling and cost monitoring frameworks should be interlinked with the management framework and supporting documentation associated with each project activity. Furthermore, the framework should incorporate the

requirements of suitable management and monitoring tools available to the project and allow options to report development progress in detail and at high-level as required.

Other considerations to achieving asset development optimization include assigning the right management and development team with relevant experience, skillset, adequate solvency, reputation, and a compliant policy and regulatory framework; an appropriate contract definition and contract management framework including effective record keeping a clear approval process; and an efficient risk management policy in place applicable across the asset development lifecycle.

In conclusion, achieving cost reduction and optimization across the asset development stages is an attainable target and the integration of multidisciplinary services across the capital asset lifecycle is a key facilitator to accomplishing this objective. ●

by **Gonzalo Quincot** | Assistant Director, Government & Infrastructure | Deloitte Middle East

Achieving cost reduction and optimization across the asset development stages is an attainable target and the integration of multidisciplinary services across the capital asset lifecycle is a key facilitator.

Construction industry survey: The Chief Executives' view



Financial prospects

88% of respondents were optimistic about the financial prospects of their company over the next 12-24 months attributed to the external factors such as economy, competition and market trends.



94% of respondents believe company's financial prospects are driven mostly by **external factors**. (2021: 78%)

Financial and operational performance

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

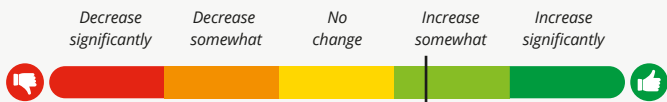
Revenues



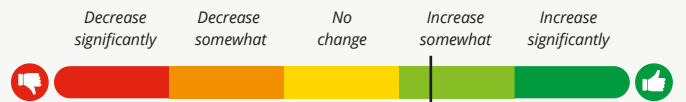
Financing costs



Operating margins



Operating cash flow



Pricing/Tender market analysis

Pricing strategy adopted to win new bids



2022: 38%
2021: 13%

An annual targeted margin set by the group/company



2022: 38%
2021: 48%

Risk with a commercial margin



2022: 18%
2021: 35%

Risk with a small margin



2022: 6%
2021: 4%

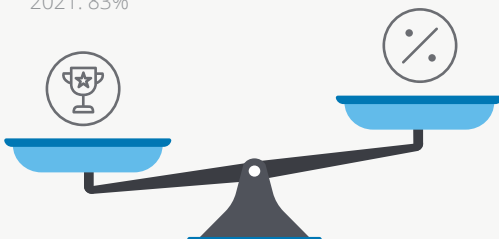
At break even with a view to make a margin on change orders

Most projects are being priced at annual target margin set by the company moving away from pricing with small margin. 47% of respondents believe pricing of tenders has improved with regards to 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.

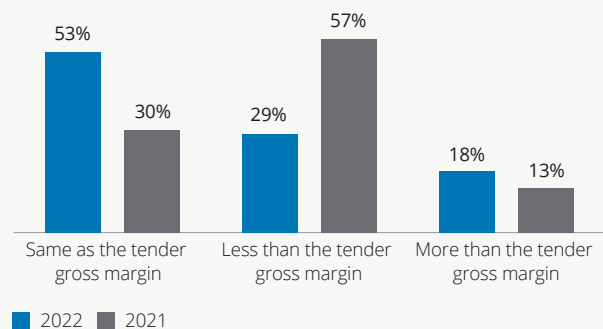
Pricing on tenders over the past 12 months

Become more competitive
2022: 53%
2021: 83%

Improved with respect to margins
2022: 47%
2021: 13%



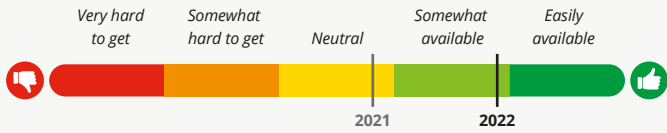
Relative to average tender gross margin, the actual realized final project gross margin is:



💰 Funding

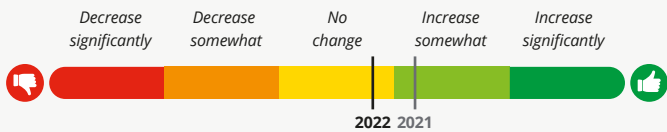
Increasing number of respondents include funding cost as a part of their initial project bids. Compared to last year, funding options are more accessible with no greater pressure due to delays in payments. Nervousness around bonds being called is no greater than last year.

Availability of financing to your company



71% of respondents include some level of project funding cost (e.g. interest on bank over-drafts/loans) in their initial project bid. (2021: 48%)

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

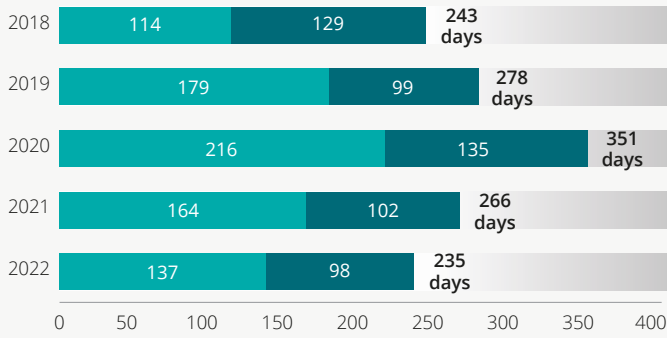


Compared to 2021, where **70%** of respondents felt greater pressure to fund projects due to delays in payments; in 2022, only **24%** of respondents compared to 12 months ago felt greater pressure while, **47%** of respondents reported no additional pressure.

📄 Certified/Uncertified receivables and WIP

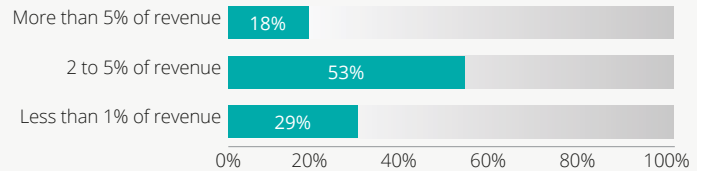


WIP to cash cycle continues to decline and is currently lower than 2018 levels and 31 days lower than last year.



76% of respondents do not include uncertified/unapproved claims in the financial statements and most (53%) believe it is only expected to impact 2-5% of the bottom line.

Significance of the anticipated settlement of outstanding unapproved contract claims to profit or loss



⚖️ Contractual dispute

There has been no substantial increase in the contractual dispute activity however, compared to last year, average resolution days have increased by 116 days.



The outcome of the dispute resolution was:

Less than we requested and less than we feel we were contractually owed
2022 : 47%
 2021: 30%

Fair to both the contract owner and the contractor or a good result for us as contractor
2022: 29%
 2021: 70%



65% of respondents (2021: 44%) 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)



75% of respondents' organization (2021:74%) are currently involved in a contractual dispute (whether due to variation, claims, cancellation or other)

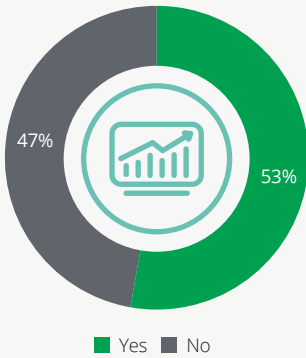
In most cases, respondents believe that the outcome was less than requested/contractually owed unlike the previous year where respondents felt the dispute resolution was fair or favored the contractor.



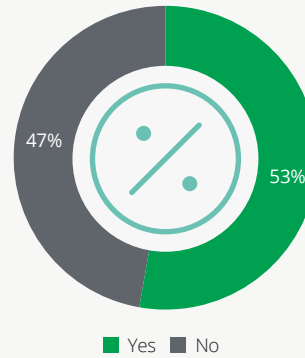
The green credentials of the construction firm

Half of respondents (53%) witnessed both increasing interest in sustainability financing options and a greater proportion of tenders incorporating sustainable elements. Unlike last year, where most 'green' requirements in tenders were observed to be either the nature of the construction firm itself (31%) and the project's construction methods (28%) levels; the new tenders are focusing more on the 'green' attributes of the specific project itself, highlighting construction methods (28%), materials used (21%) and project design (21%). The majority of respondents (75%) viewed sustainability as a competitive advantage over a necessity. A large proportion believes that Sustainability needs to be regulated at an industry and country level to drive change (93%) but only just over half of respondents (53%) believe that existing Green Building regulations are currently sufficient to drive forward that change.

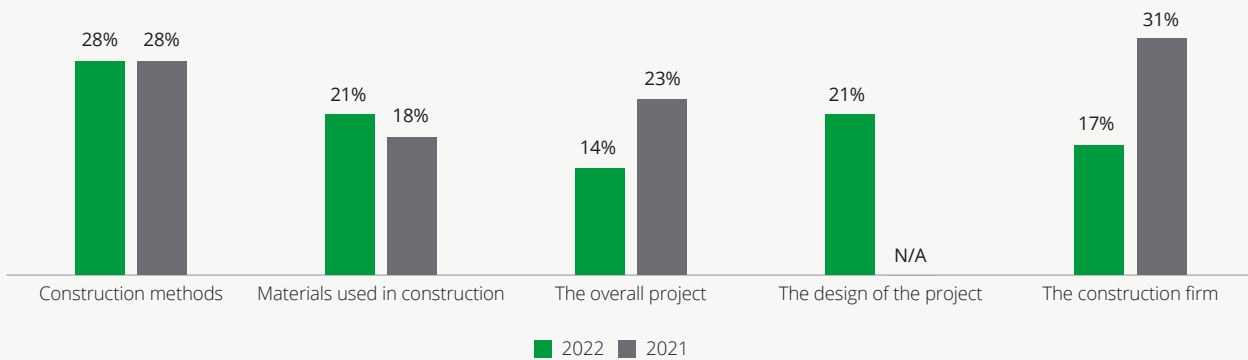
Has there been an increase in green bonds/loans/sustainability linked loans to finance projects?



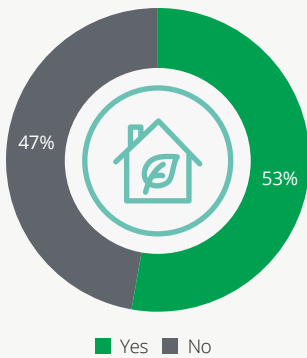
Has there been a greater proportion of tenders incorporating sustainability/green elements in the requirements?



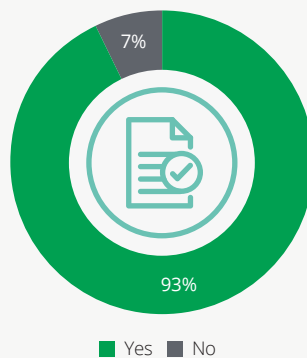
Sustainability/Green elements in the tenders



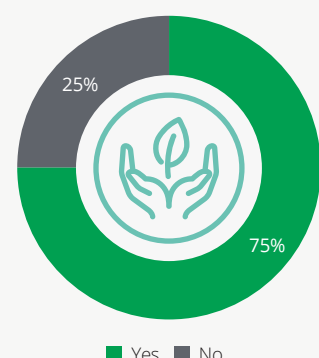
Do you believe green building regulation is enough in your country to drive forward change?



Should sustainability and the construction industry be driven by regulations or the market?



Is being a sustainable/green organization an advantage and not an expectation in the market?

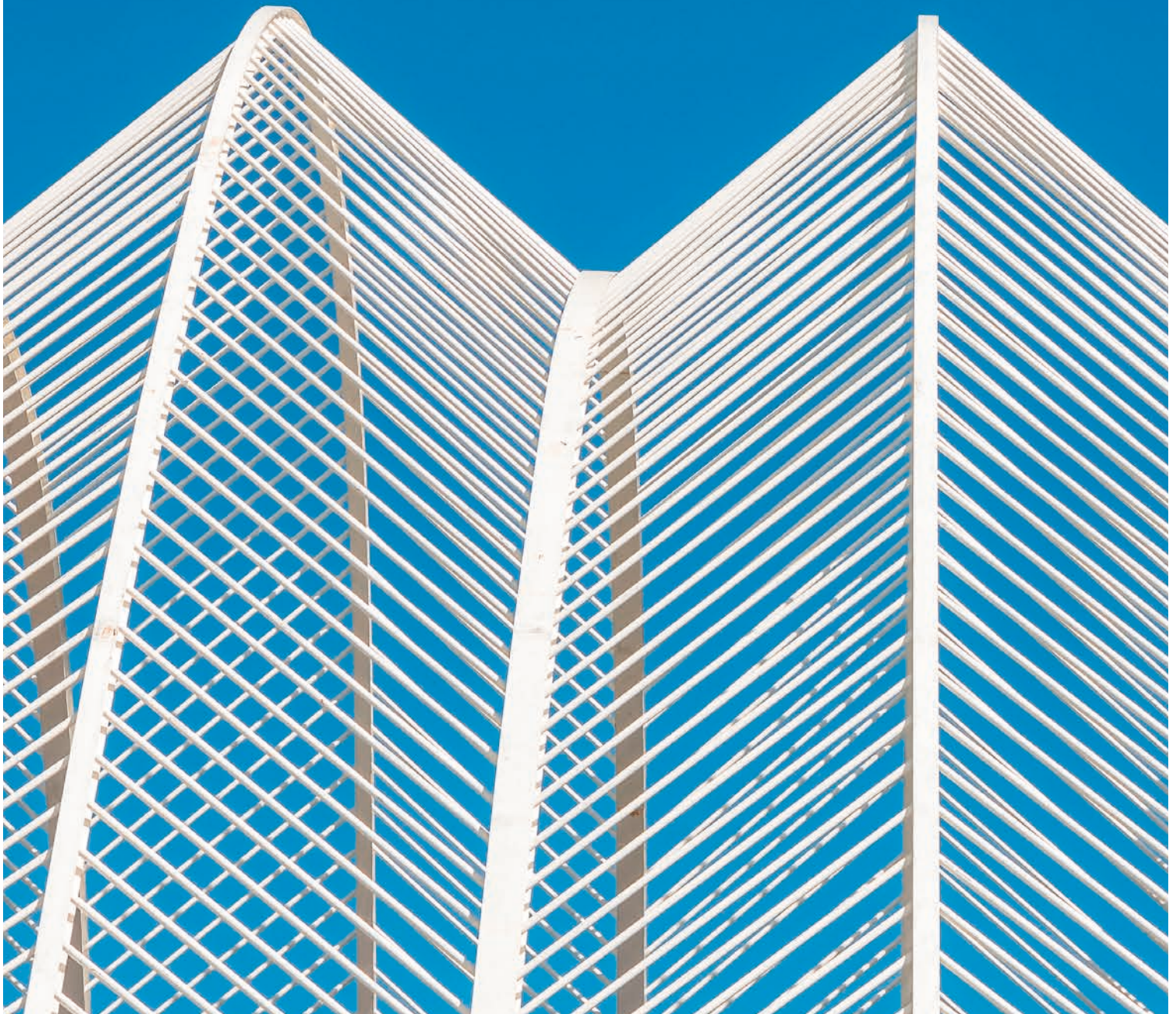


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The shifting landscape of capital project disputes



Introduction

In recent years, the entire construction value-chain has had to adapt to a rapidly changing and disruptive environment. COVID-19, regulatory changes, ESG mandates, emerging technologies, supply chain challenges, economic fluctuations and other external circumstances make it increasingly complex to forecast time, risk and cost of infrastructure and capital projects.

Indeed, Bent Flyvbjerg, Professor of Major Programme Management at the Saïd Business School in Oxford University, states that **around 92% of construction and infrastructure projects of over USD\$100m come in over budget and/or late and that more than 99% fail to deliver on budget, on time and on benefit**¹. Unfortunately, these failings often lead to recrimination and disputes, but there are steps that the contracting parties can take to help avoid or at least mitigate these occurrences.

At inception

While the majority of disputes arise during the construction and execution stage of capital projects, there are steps that can be taken at project inception to reduce their likelihood. The best approach is for the client to accurately forecast the project during business case development, investment decision and planning, including ensuring fully detailed scope, inter-dependencies and requirements are prepared, as well as a realistic budget and timeline.

A common cause of disputes is misalignment or misinterpretation on

contract scope and obligations, as well as poor administration of the contract by both parties e.g. contractors often rely on informal communication, fail to maintain contemporaneous records and fail to comply with contract procedures and timeframes; and, clients often outright reject or delay interim assessments on time and cost claims and variations. Payment certification is often a prolonged process which leads to significant cash flow constraints on the contractor and supply chain, who effectively end up financing projects for extended periods while payment certification and claims assessment occurs. Towards the end of projects, claims by the contractor often remain rejected or in abeyance until additional information is provided, while the client may choose to consider its rights relating to liquidated damages or bonds, which further delays release of payments as the claim discussions become protracted. This often results in breakdown in communication between parties and usually results in the commencement of dispute procedures.

Therefore, it is important that:

- The client adopts an organized procurement approach and form of contract that best balances risk, reward, and obligations among the contracting parties. Form of contracts should be as close to standard as possible, as there is typically literature provided by the contract body relating to intent and interpretation. When a standard contract e.g., FIDIC red/yellow book, is heavily amended, this interpretation and intent can become unclear and will need to be resolved

between the parties;

- During the contract execution, the parties must remain objective in their actions and determinations, and always maintain open lines of informal and formal communication; and
- The contract clearly sets out the dispute procedures to follow and the governing law and courts, and that the parties adhere to this. If one of the parties attempts to bypass the procedures e.g., move to arbitration or litigation before trying to settle amicably or attempting mediation, then it wastes time, resource and ultimately costs more to resolve.

Alternatives to courts/arbitrations

As stated above, disputes in the construction industry usually arise from contractual misunderstandings, poor clarity of the scope of work and the project terms and conditions, lack of records, and unestablished processes for undertaking activities during project execution. A common issue is contractors mobilizing resources and carrying out construction works without a formalized contract amendment or approved variation order, aiming to meet tight handover deadlines. This practice is detrimental for both the contractor and the client, entering in a vicious circle of unjustified claims, progress delays, and budget overruns.

To prevent these issues, two key elements should be implemented in both fronts i.e., client and contractor: (1) effective record keeping and (2) well-established approval processes. This way, even if there is lack of clarity in the contract, or requirements are out of the initially agreed scope, they can be identified and properly addressed before actioning. Even when the project is already receiving claims or facing disputes, the way to resolve them is by going back to existing records and approvals that substantiate the case.

It is becoming increasingly common that contract dispute procedures include alternatives to arbitration and litigation,

The best approach to avoiding disputes is for the client to accurately forecast the project during business case development, investment decision and planning, including ensuring fully detailed scope is prepared, as well as a realistic budget and timeline.

such as expert determination, amicable settlement and/or mediation. When disputes do arise, the parties should meet and endeavor to resolve the dispute amicably or should undertake mediation as a final step before going to arbitration or the courts.

The use of technology

As with nearly all industries, the pandemic has accelerated the adoption of new technologies in the construction industry, such as collaboration software, various data analytics tools, IoT devices, geospatial analytics and modelling systems. These systems and various internal and external stakeholders generate exponentially growing data volumes; however, 80-90% of that data is “dark data” that is unstructured, unanalysed and dormant.

It is imperative that construction projects establish data governance as a key component of the plan in order to derive real-time actionable insights and increase access to information to all key stakeholders,

avoiding information silos in disparate data sources. With the continuous increase in data volumes and data sources, it is crucial to bring all the relevant data sources in a unified repository to build a complete and accurate picture of events in construction disputes.

A lot of potential improvements can be identified during the integration phase, where all the systems are analyzed from the perspective of one well-functioning machine. It is a collaborative process that considers legacy infrastructure with modern additions, like smart technologies.

The current state of the industry is characterized by a fragmented approach, with disparate software solutions being utilized by different stakeholders, often leading to miscommunication, delays, and disputes. Overcoming the challenges associated with integrating various systems in the design and construction process and leveraging emerging technologies requires a multifaceted approach which need to

include collaboration and communication, standardization and interoperability, education and training, the carrot of incentivize adoption and the stick of regulatory support.

The future

The future of construction management will include the addition of IoT sensors for continuous monitoring, blockchain could be integrated with BIM systems to create a more transparent and efficient construction process. This would enable real-time tracking of materials, progress and payments, reducing the risk of disputes arising from miscommunication or lack of clarity. Furthermore, **integrating blockchain into the construction ecosystem could simplify dispute resolution through the use of decentralized arbitration, allowing for a faster, more cost-effective approach to resolving conflicts.**

Advancement in technology is still key to addressing the challenges created by the exponential increase in the volumes, types, and complexity of data. For instance, the use of artificial intelligence (AI) and machine learning (ML) increasingly used for disclosure in arbitration as well as new areas such as spotting errors in evidence and fraud detection.

As we look to the future, technology will also eliminate the need for some arbitral disputes. China already has digital courts which are presided over by an AI judge; The tech-forward Estonia is also developing an AI judge that can adjudicate small claims disputes. Meanwhile, Canada is using robot mediators and has recently had success settling a case using such technology.

An emerging approach to help avoid disputes is the use of regular scanning/surveying of progress at sites using LiDAR, point cloud or similar technologies to verify works completed at a particular point in time. This data can be used to support progress payment certifications and be included as substantiation to help resolve claims.

Conclusion

Research, such as that completed by Saïd Business School, indicates that the construction and infrastructure sector are failing to deliver projects in excess of \$100m on time, within budget and on benefit. The failure to deliver these projects across the sector is creating adversarial relationships between contracting parties, and regularly leads to complex disputes which require significant resources, time and expense to resolve. In recent times, there has been increasing dialogue and collaboration between academia, industry and professional service consultancies from the construction sector who all have the ambition to find innovative and adaptive ways of successfully delivering infrastructure and capital projects. This is a complex area that needs to be addressed in a multi-faceted and courageous manner by the construction value-chain, and in particular public sector clients who are the largest procurer of major construction and infrastructure projects. Now is the time for the construction industry to start focusing on sustainable project selection, alternative procurement models, balanced risk allocations, effective contract management and increased investment in emerging and new technologies to support in creating a more trusting and transparent contracting environment. The future of successful infrastructure and capital projects depends on it. ●

Source:

1. How Big Things Get Done [2023] by Bent Flyvbjerg and Dan Gardner

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