



2021 engineering and construction industry outlook

E&C companies adapt to ongoing impacts of the pandemic

The US engineering and construction (E&C) industry began 2020 on a bright note. The construction industry added more than \$900 billion to the US economy in the first quarter of 2020—the highest levels since the 2008 recession.¹ It employed 7.64 million people in February 2020, also the highest levels since the 2008 recession.² Then, COVID-19 reached the US. The industry lost \$60.9 billion in GDP, and total jobs decreased to roughly 6.5 million, effectively wiping out two years of GDP gains and four years of job gains.³

The E&C industry, however, had learned from the 2008 recession and was well-positioned to weather this economic shock. It had better control over its leverage and credit and had created a buffer through additional cost savings. However, industry performance during the rest of 2020 has been mixed. Some E&C companies were more exposed to COVID-19-affected segments (like retail

and hospitality), while others were not able to capitalize on technology advancements. Most E&C companies continue to face sustained cost and margin pressures. Additionally, despite strong order books, companies are experiencing challenges such as project delays and cancellations and difficulty in obtaining permits. In addition, increases in procurement cost of materials and equipment continue to perplex many E&C companies.

But there are reasons to be optimistic. Connected technologies and an increase in associated investments may help firms realize new operational efficiencies. New business models and an increase in M&A activity are further accelerating the shift toward digital and operational efficiencies. Also, E&C companies are likely to help other industries unlock the future of workplace solutions.



About the study: Deloitte postelection survey

To understand the outlook and perspectives of organizations across the energy, resources, and industrials industries, Deloitte fielded a survey of more than 350 US executives and other senior leaders in November 2020 following the 2020 US presidential election. The survey captured insights from respondents in five specific industry groups: chemicals and specialty materials, engineering and construction, industrial products, oil and gas, and power and utilities.



2021 prospects

An uptick in public and commercial spending could improve the outlook for 2021

In March, the pandemic made its presence felt across the E&C industry, causing the Associated Builders and Contractors' Construction Confidence Index (CCI) to plummet to 38.1.⁴ By June, however, the CCI rose to 51.1, indicating expansion in sales.⁵ The industry has also seen construction spending gradually recovering from the sudden decline in the first half of 2020.⁶ A Deloitte postelection poll (see "About the study") found that 68% of the E&C executives surveyed characterize the business outlook for their industry as somewhat or very positive. Overall business performance in 2020 can be described as uneven, depending on where an E&C firm sits in the postpandemic economy.

The housing segment is recovering on the back of low mortgage rates, and US housing starts are expected to grow in 2021.⁷ On the homebuilders' front, extra credit buffers and conservative financial policies are likely to keep confidence high.⁸ In contrast, the nonresidential segment new construction value is expected to register double-digit declines in 2020.⁹ Apart from health care, public safety, and water infrastructure, spending in other nonresidential segments either remained the same or declined. Lodging (including hotels and motels), manufacturing facilities and structures, amusement and recreation, and office segments observed the biggest spending declines in 2020 compared with 2019.¹⁰ Many companies are also evaluating their future office space requirements as remote and work-from-home models evolve, leading many commercial clients to either delay or cancel their existing leases and contracts. This weakness is likely to persist well into 2021.¹¹

The different outlooks for residential and nonresidential segments can present various challenges for E&C companies in 2021. Smaller E&C firms with less balanced portfolios or a higher exposure to energy, travel, hospitality, or recreation end markets are likely to experience greater volatility in the coming year. Larger E&C firms with more diversified exposure may absorb this impact better. While the residential segment is expected to recover through 2021, overall spending growth in 2021 will likely be led by an uptick in public, infrastructure, and commercial building starts and related investments. In fact, in a Deloitte postelection poll, 70% of E&C leaders agree that new infrastructure projects, if fully approved, can help jump-start the economy.



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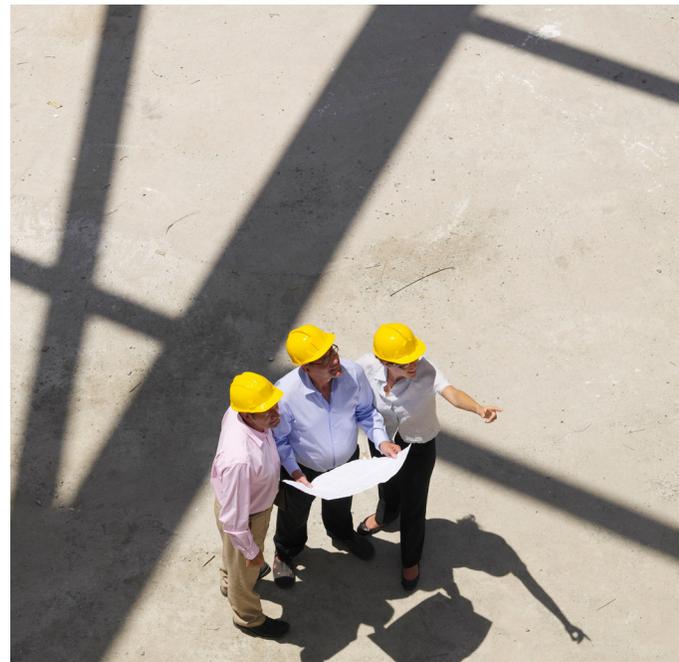
Margin disruption

Connected construction and modularization can address long-term costs and margin issues

The E&C industry has been operating on razor-thin margins for many years now, and the situation has only worsened since the pandemic outbreak.¹² In our [2020 outlook](#), we mentioned how the Turner Building Cost Index, which measures US nonresidential building construction market cumulative costs (including labor rates and productivity, materials prices, and competitive marketplace conditions) had reached a value of 1162, the highest levels in its 13-year history.¹³ The pandemic led the index to reach a new peak of 1189 by the end of the first quarter of 2020.¹⁴ Since then, the index remains near the all-time high, likely driven by rising labor and material costs and supply disruption as global supply chains continue to recover.¹⁵ A similar impact can be seen on margins as well. The September Associated Builders and Contractors survey shows that almost 77% of contractors surveyed indicate no change or a decline in profit margins, up about 10% from a month earlier.¹⁶ Despite many E&C firms altering their cost structures, most suffered due to increasing material costs, contract extensions, and even extended schedules leading to cost overruns.

To reverse this situation, E&C companies should consider several ways to create long-term efficiencies and competitive advantage in 2021. One option is to save costs via modularization and prefabrication design. Twenty-six percent of E&C executives in a Deloitte postelection poll indicate increasing their use of prefabrication and modular products. Module assembly yards borrow some of the cost-efficiencies of manufacturing and could lead to considerable cost savings, ranging from 6% to 30%.¹⁷ Besides material costs, modularization and prefabrication can also help reduce labor costs, ensure better design and quality control, and shorten the project schedule to ensure minimum budget overruns.

And, although this is a longer-term potential payoff, E&C firms can also invest and move toward advanced construction materials, such as durable or high-strength concrete, geosynthetics, geotextiles, fire-resistant timbers, and self-healing materials. Twenty percent of E&C executives in a Deloitte postelection poll indicate they are sourcing and using advanced materials to address ongoing cost pressures. These may increase up-front costs, but can likely help in later years to minimize and significantly reduce operating and maintenance costs.¹⁸ This could become a key trend as the industry embraces more streamlined and connected approaches through the project life cycle, beyond Design-Build-Operate to better Own and Maintain as well (DBOOM).



Another approach is to change the focus of technology investments from isolated projects to integrated, enterprise-level initiatives. Firms should make technology investments that solve business-level efficiency problems instead of stand-alone project-related issues. Through enterprise-scale technology investments, E&C companies can develop a connected construction foundation—a dynamic, always-on network that provides continuous access to information, analytics, and insights.¹⁹ Benefits are expected to include as much as a potential 10% to 30% reduction in engineering hours, up to 10% reduction in build costs, and up to 20% reduction in operating costs, improving overall margins for E&C firms throughout the entire project life cycle.²⁰

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Digital differentiation

Digital investment can enable E&C firms to differentiate themselves in 2021

Digital is becoming the core enabler of future success in the construction industry. In a Deloitte postelection poll, 76% of E&C executives indicate that they are likely to invest in at least one digital technology in 2021. Digital moves business decisions from reactive to predictive and could enable E&C firms to outpace their competition. For this reason, it is likely to be a priority on CIOs' growth agendas in the coming year. Here are some specific areas and opportunities of digital initiatives that could enable E&C companies to differentiate themselves:

- Technologies such as **building information management (BIM)** can help enhance real-time project visibility, eliminate cost overruns, and accelerate the development timeline.²¹ Further applications of BIM into offerings that incorporate energy efficiency and facilities management for comprehensive lifecycle project management are also emerging.
- **Digital supply networks** can help to calibrate demand and supply by ensuring constant material availability using machine learning and cognitive computing. This could help solve for a key challenge that 54% of contractors surveyed in a recent study indicate: the shortage of at least one construction material.²²
- **Digital twin** technologies can help make use of 3D data to generate building profiles and blueprints of building parts and components in real time, driving visibility and operational improvements across the building life cycle.
- **Autonomous rovers and drones** can help conduct remote site inspections.²³ This can not only help improve worker safety, but also enhance productivity for inspection operations.
- After project delivery, **predictive maintenance** technologies can help E&C firms better manage assets and equipment. Preventing any equipment downtime can increase efficiency and ensure on-time project delivery.

Since some of the E&C industry seems to be lagging other industries in digital strategy and maturity, there is pressure to increase the pace of digital investments. However, it is equally important for E&C companies to ensure



that these investments deliver value and returns. One approach is for E&C firms to identify ecosystem partners and connect with them to enable connected construction together.²⁴ This ecosystem approach can likely be a key enabler for adjusting to new market realities, helping to better respond to disruptions.

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M&A and alliances

The industry is likely to witness strong activity in both traditional and nontraditional partnership approaches

As a learning from the 2008 recession, the E&C industry has been increasingly conscious of its capital allocations and cost structures. These efforts, combined with additional postoutbreak cost reduction efforts and strong order books (1.3x book-to-build ratio based on 2019 data), have ensured enough cash and credit line buffers for companies to survive and cover liabilities in the short term. These spending cuts, however, also led to a 7x decline in 2020 M&A deal value when compared with 2019 (\$780 million in the first three quarters of 2020 versus \$5.89 billion during the first three quarters of 2019).²⁵ The industry also avoided megadeals, with no deals above \$500 million through the third quarter of 2020 compared with four in 2019.²⁶

Interestingly, the number of deals announced remained the same during the first three quarters of 2020 compared with the same period in 2019.²⁷ This likely indicates that while the industry delayed making big commitments, it also kept its eye open to acquiring smaller and more specialized firms, including design, engineering, or technology companies; fabricated metal manufacturers; and specialized contractors. During this period, E&C and engineering, procurement, and construction (EPC) firms engaged in divestitures to gain specialization, increase margins, and decrease risk. In a Deloitte postelection poll, 28% of E&C executives surveyed believe the main approach for the industry will be increased M&A activity to help diversify the business. Such moves are likely to accelerate in 2021 as companies launch their initiatives to diversify digital product portfolios and expand offerings in connected services and advanced technologies.

As we move into 2021, more E&C companies are also expected to target different business models (such as alliances to complement their expertise) and targeted consolidation. These alliances can likely also include E&C companies embracing public-private partnerships (PPP) and making them part of their network. More than 46% of E&C executives surveyed in a Deloitte postelection poll indicate that new public infrastructure work will be a significant part of their business, and 14% are looking to form public-private partnerships to access these opportunities. The collective capabilities of partners may help companies better target the more than \$1 trillion in US infrastructure upgrade spending anticipated in 2021.²⁸



Nontraditional M&A approaches, such as forming alliances with technology vendors via the developing ecosystem,²⁹ can help E&C companies gain access to new capabilities and turnkey solutions faster and without the need for up-front investments.³⁰ Targeted consolidation in a fragmented and competitive US E&C industry is also likely to help enhance overall industry margins and lead to the emergence of bigger E&C companies.³¹ For example, between 2007 and 2020, the number of E&C companies on the Fortune 1000 list has grown by 45%.³²

Another trend to watch for in 2021 is more E&C companies realigning their exposure to end markets via targeted divestiture efforts. In a Deloitte postelection poll, 60% of E&C executives indicate plans to diversify their business to reduce exposure to underperforming segments. From 2017–2020 year-to-date, 17% of all deals in the industry were E&C companies divesting specific business segments, likely exiting low-margin product segments and balancing exposure to underperforming end markets. More recently, some of this activity may be related to reducing exposure to segments affected by COVID-19, such as energy and transportation.

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Future of work

E&C firms respond to new work, workforce, and workplace norms

A rapid influx of digital technologies, ongoing labor shortages, COVID-19 anxieties, and new workplace protocols present E&C firms with work, workforce, and workplace challenges as they head into 2021. In the wake of the pandemic's arrival, the biggest question on the minds of E&C companies has been how to restart work at job sites. The industry could not necessarily reemploy the very same workforce, as some workers had been hired into other positions, which made it challenging for some E&C companies to resume work. This was followed by workplace challenges of ensuring that job sites had the required safety standards in place, which included restrictions in the number of workers in an enclosed space and alterations in key job site processes.³³ Most E&C firms have absorbed these changes, but more work disruption may await the E&C industry in 2021.

In terms of workforce, the construction industry has been consistently adding new jobs and has recovered largely from the initial pandemic-driven job losses of early 2020. Despite this recovery, challenges due to talent shortages persist and are likely to be among the major themes for 2021. Bureau of Labor Statistics data suggests that since 2017, while the number of job openings has almost doubled, the number of new hires has increased by less than 10%.³⁴

This gap is due in part to the fact that the construction industry is likely to incorporate more digital technologies into key work streams in order to further enhance productivity, efficiency, and worker safety. These technologies include BIM and digital twins, which affect work from the design stage through material performance testing and remote project monitoring using sensors and drones. In fact, 76% of E&C executives in a Deloitte postelection poll indicated they are investing in connected technologies to address broad cost and margin challenges, and 24% are investing in drones and robotics at job sites to increase worker productivity and efficiency. These work changes make it important for E&C firms to start thinking of how roles and jobs will change to reflect the use of these new technologies.



The ongoing skills gap in the era of digital transformation can create a mismatch between the available employees and the necessary skills—as work increasingly requires fluency with digital technologies.³⁵ This situation could negatively affect E&C firms in various ways, including not being able to respond to market needs, losing project bids, and failing to innovate. As E&C firms seek approaches to mitigate these potential negative impacts, there are some practices that will likely increase in the coming year. Engaging with an external talent ecosystem, developing in-house training programs, and training the future workforce are some of the long-term strategies that most E&C companies should consider adopting.

Preparing today for tomorrow's unknowns

2020 was an unforgettable year in many ways and one that may have permanently changed the world. The E&C industry was able to respond faster than other industries due to strong order books and demand from the residential segment. 2020 likely also helped E&C companies to reset and prepare sooner and better for work, workforce, and workplace changes. The year ahead is only expected to accelerate these changes. Connected construction presents a host of efficiency- and productivity-enhancing technologies and can enable new business models and strategies. There may be another disruptive event around the corner that could catch the world off guard. But those E&C firms that add to the lessons they've learned by embracing digital, forming strategic alliances, and preparing for the future of work will likely be better prepared for whatever comes next.

Let's talk



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