

# THE YEAR OF INFLATION

International Construction Costs 2022

# Foreword

The road to recovery from COVID-19 has been a rocky one. Strained logistics networks, surging demand for critical global commodities, waning stockpiles, and global inflationary pressures all hit during 2021. The conflict in Ukraine is set to exacerbate material and hydrocarbon shortages, with significant repercussions for global commodity and energy markets.

Construction, however, has again proved itself extremely adaptable during the last year in responding to the difficult circumstances. We have seen sustained delivery of housing and infrastructure across most global markets, better use of data, and increasing investment in technological solutions such as modern methods of construction, all of which can improve efficiencies and aid the drive to net-zero.

This adaptability will prove vital as businesses ready themselves for the uncertain and inflationary environment ahead. This theme is central to our 2022 International Construction Costs Index, which highlights dramatic price fluctuations in many regions around the globe.

While there is healthy confidence in the future of the construction sector internationally, differing government COVID-19 strategies have resulted in varying paces of recovery. Meanwhile labor and skills shortages have caused supply and demand challenges in many areas, such as Europe.

These shortages have been felt across the supply chain, forcing businesses to tackle pressing and persistent problems such as low productivity, staff retention and project resilience. Our five-point plan later in this report provides a pragmatic guide to dealing with the unique challenges of 2022.

Sustainability is equally high on the agenda. Construction and operation of built assets is responsible for 38% of global greenhouse gas emissions, according to the UN Environment and International Energy Agency's 2019 Global Status Report. COP26 also emphasized the growing need to transition away from fossil fuels, as our recent 2021 Supercharging Net Zero report details.

In the face of ongoing material shortages, efficiency and productivity remain a must. In this respect, the need for efficient design is likely to drive further investment in innovative solutions, while a big push from many governments, both in terms of financial support and the implementation of legislation, has crystalized long-term sustainability commitments.

While on the surface the looming market conditions sound unfavorable, we believe these challenges more than ever present our industry with a great opportunity to drive forward innovation. In order to reduce our impact on the environment and our reliance on resources, we need to adopt a mentality of doing more with less.

This report will give you the insight you need to navigate the current and future challenges ahead. It will show how flexible, pragmatic decision-making can allow businesses to adapt to fluctuating and unpredictable conditions and put themselves in a market-leading position to take advantage of a period of growth.



**Andrew Beard**

Global Head of Cost & Commercial Management

# The Arcadis International Construction Costs Index 2022

## Pathway to recovery

### A look back at 2021

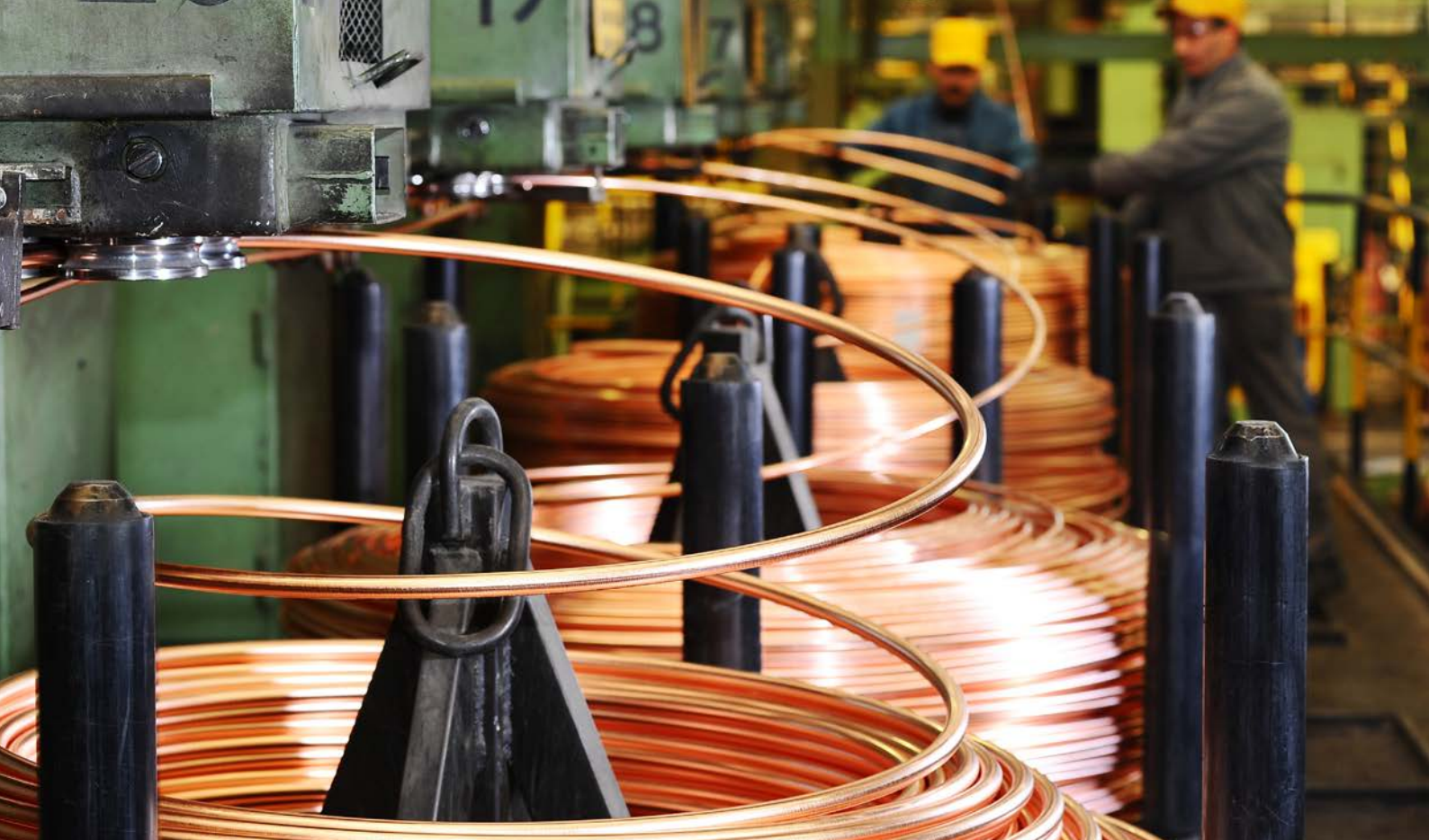
The roll-out of COVID-19 vaccines in many countries paved the way for a second wave of economic resurgence in early 2021. From the second quarter onwards, and after a series of successive lockdowns, a synchronized global recovery started to gain momentum. This wave of opportunity has had significant implications for many construction markets covered by our International Construction Costs Index.

First and foremost, in response to the snap-back of the global economy, the supply side has struggled to build capacity. This is due to a combination of factors, ranging from a shortage of personnel to pressures in the logistics market. Combined with a strong recovery in commodity prices, all these factors have created unusually inflationary conditions.

Global GDP growth reached 6% in 2021, according to the International Monetary Fund (IMF), and is expected to reach 4.4% in 2022. Much of this is bounce-back from dismal levels of output in 2020 and the first quarter of 2021.

In parallel, Consumer Price Index (CPI) indicators across the world rallied, with both developed and emerging economies recording annual price increases well above 5%. Despite hopes that inflation might be temporary, Central Banks indicate that price increases are here to stay, reversing the expansionary policy stance adopted in response to the pandemic. So far, this has not stifled the markets and construction is booming in many locations despite the headwinds.





### Who is top of the index and what are the major changes?

In 2021 construction costs increased significantly in most locations, with inflation reaching levels not seen in recent years. As this was the case across the world, the cost increases are not immediately obvious from the ranking. Many cities remain clustered together like last year. The Top 10 remain largely the same, though Geneva and London swapped the two top positions, and Oslo took third place.

Due to a combination of cost drivers and high sector-specific demand, markets in North America and in many European cities recorded double-digit cost increases. As a result, American cities moved up significantly in the ranking. This upward trend was also helped by the US dollar appreciating on average by 5% against most currencies.

Cities in the UK and Germany also move up the index.

Across Asia, the picture has been mixed, with costs largely remaining stable. One exception is Singapore, where difficulties in accessing labor triggered high levels of inflation. In Australia and the Middle East, on the other hand, demand levels did not quite meet expectations, leading to a more competitive market and a more significant part of costs being absorbed by the supply chain. This has resulted in locations such as Melbourne or Sydney dropping as much as 10 places in the ranking in 2022.

### Cost analysis: Where is the inflation coming from?

Construction markets were among the first to be impacted by increasing prices. In fact, throughout 2021 we faced two waves of inflation. The first wave arrived in the second quarter of 2021, driven by an increase in commodity prices – copper recorded a 70% increase; aluminum was up by almost 40% compared to pre-pandemic levels; and iron ore more than doubled in price, sending the cost of steel to a historic high. But from a price inflation perspective, the top spot was taken by timber. Due to a boom in the US housing sector, along with rampant demand from the home improvement market, this more than tripled in price.

By the fourth quarter, demand for these commodities eased slightly and iron ore dropped by 50%. However, as the cost of energy started spiraling, materials that are energy intensive to produce – such as cement, glass or tiling – began to increase in price by 10-15%. Timber seems to be joining the second wave of price inflation too, driven by lower harvests in the US and Canada. Steel also remains expensive.

While inflation driven by the price of construction materials is apparent, we have yet to see the potential impact of labor costs. As a result of the pandemic, in many markets there have been shifts in labor availability, with some migrant workers returning home, some moving countries, and some quitting the sector to either retire or requalify.

While data on the exact numbers of workers is scarce, and pay trends can be difficult to follow, there is plenty of anecdotal evidence of workforce shortages in our market commentaries. This is something to watch, and a potential cost driver likely to keep inflation at elevated levels in 2022.

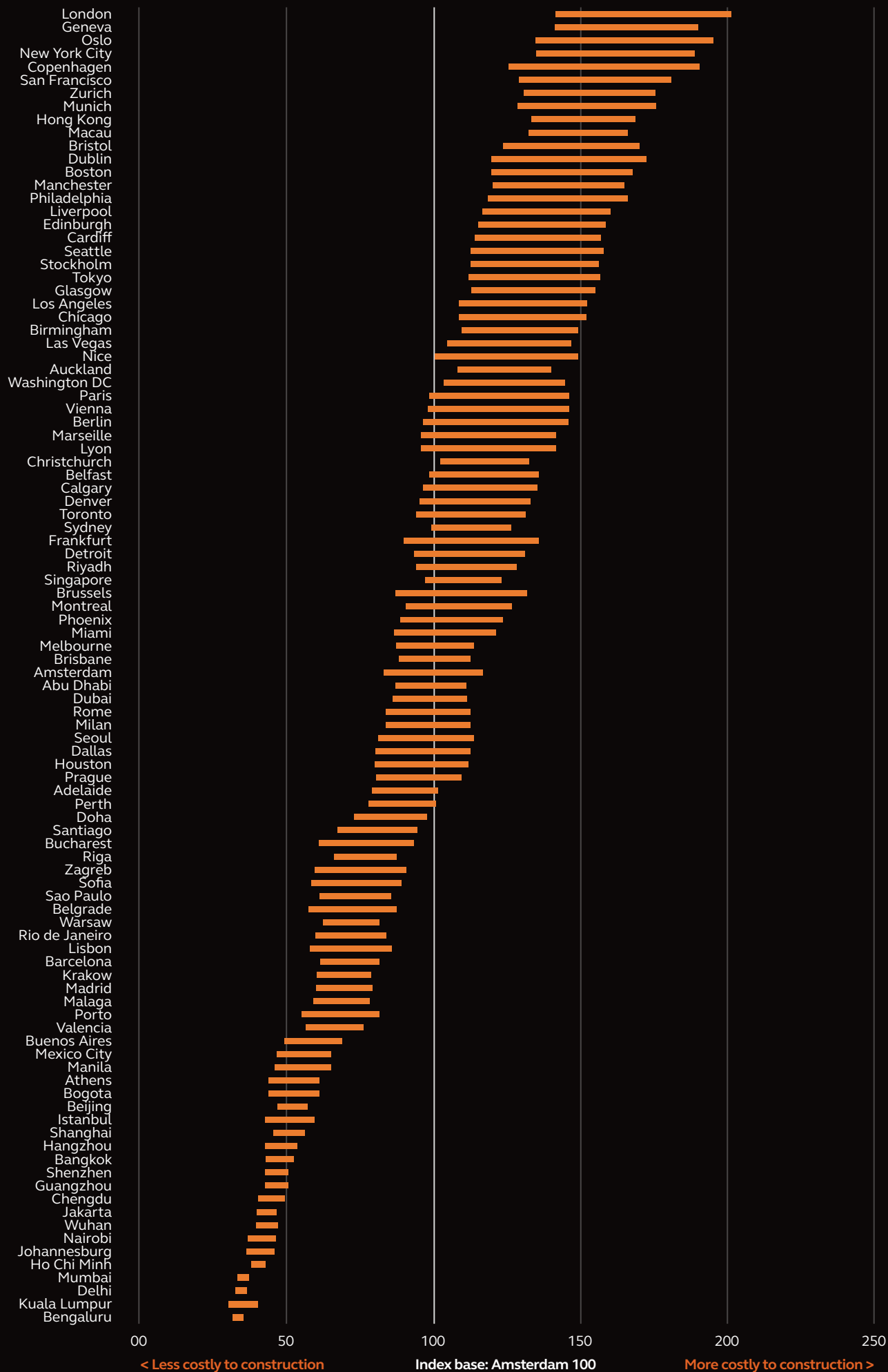
Despite these challenges, construction markets across the world are booming – but the impact of inflation is different for different sectors.

The residential sector, which is sensitive to timber pricing, has mostly been able to pass on the additional costs in a flourishing real estate market. Similarly, so has the private industrial sector. Despite exposure to the elevated cost of materials like steel, in many locations private industry has delivered record output.

The commercial sector's performance has varied, with overall work delivery rates falling well below pre-COVID levels. The office market, however, has been recovering steadily – albeit with a bigger contribution from refurbishment projects. Going forward, sectors capable of passing costs down the supply chain are likely to continue delivering. The ones with restricted resources may need to consider rationalizing their scope of work. Ultimately, whilst inflation will eventually slow, it may take time to eliminate.



# International Construction Cost Index 2022



## Deep dive: The role of energy in the construction materials supply

The manufacturing of many materials used in construction is highly energy intensive. For materials such as steel or cement, more than half of the energy used comes from coal – either metallurgical or thermal. Natural gas is mainly used in the production of bricks and roof tiles. Such high exposure to coal, gas and electricity makes the construction materials sector particularly vulnerable to prolonged energy price increases.

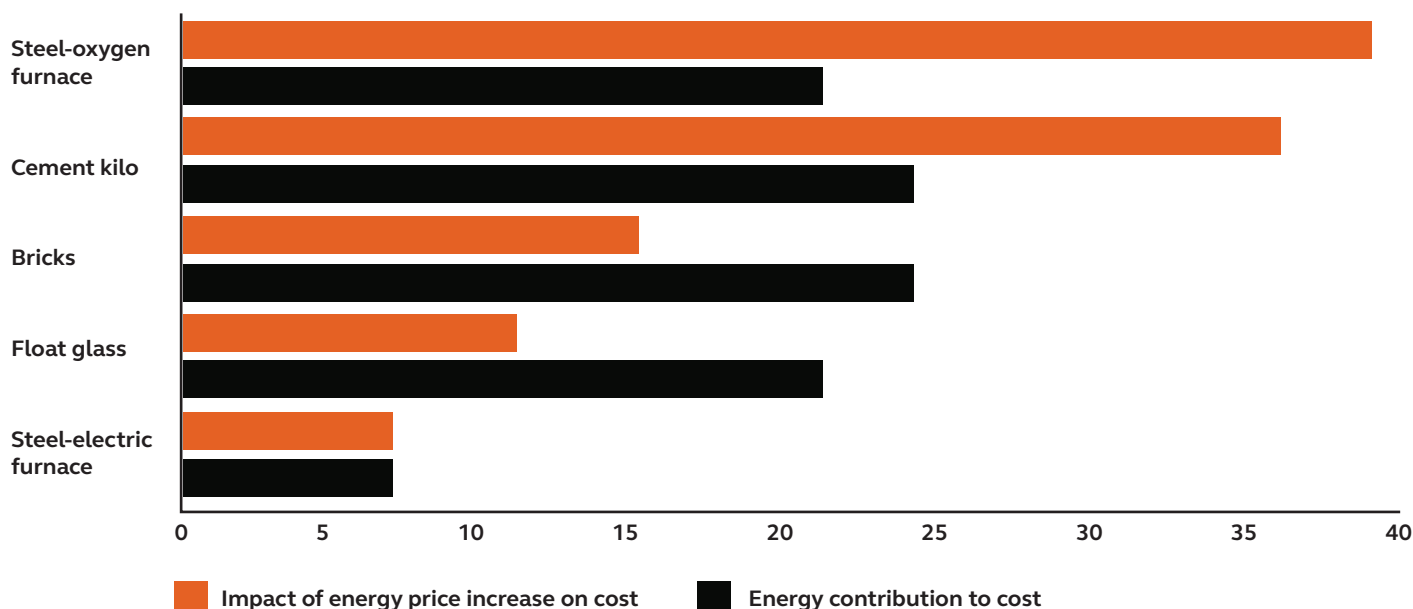
In Figure 1 we illustrate how the recent price increases impact costs for some of the most energy-intensive materials. The data was compiled before energy prices spiked in response to the Ukraine invasion. The chart shows that energy costs account for up to 38% of the total costs associated with some energy-intensive manufacturing, such as blast furnace steel and cement. With the energy mix for different processes increasing by around 20-25%, clearly the impact of further increases in energy costs will be significant. This prompts the question – how long will energy costs continue to escalate?

Even before the latest crisis, there was no simple answer. The International Monetary Fund (IMF) had forecast natural gas prices to stabilize by the end of the second quarter of 2022 at a level 50% higher than the start of 2019. However, since the invasion of Ukraine, wholesale energy prices have stayed above the high prices seen in January and February 2022. Given the uncertainty, no one is attempting to forecast energy prices at the moment. However, what is clear is that construction, with its exposure to energy-intensive materials, will be one of the industries that pays the price.

Looking back at 2021, various global data sources point to an average increase in 2021 of 25% for the price of a basket of construction materials. In addition, prices of new categories of materials - including cement, bricks, glass and plasterboard, which so far did not record elevated levels of inflation - are accelerating. This indicates that clients and the construction supply chain will have to endure another year of price uncertainty.

The extent to which manufacturers of construction materials are exposed to fluctuations in the price of coal, electricity and gas isn't going away. Looking further ahead, the global transition to cleaner energy may result in higher costs of gas and electricity, as more generators move away from coal power. However, as the share of renewable electricity grows, prices should stabilize eventually and fall.

Figure1: The contribution of energy costs to construction materials prices and impact of recent energy price increase (quantified in % increase on product price)



# Secrets of success in an inflationary market

The current worldwide pressures on construction, manufacturing and resources, are due in part to COVID-19. Market stability has not been helped by seismic shocks to the global economy caused by recent geopolitical tensions. This has created an ongoing inflationary environment that has caused a set of new challenges for clients to grapple with:

- An uncertain and volatile market
- Increased risk due to difficulties in predicting cost
- Pressures felt throughout the supply chain
- An increasingly complex and challenging climate change agenda that will need to balance energy and resource security alongside rapid progress toward Paris Agreement goals
- The conflict in Ukraine causing huge market shifts and resource restrictions

These problems are sizeable and complex. In addition, a looming viability challenge, caused by the likely cooling of an asset boom across sectors such as housing, commercial and logistics following COVID-19, could exacerbate the situation further.

With little room left to maneuver, boosting productivity is key. Global labor productivity averaged just 1% over the last two decades, according to the McKinsey Global Institute. If values are to grow, organizations will need to make some rapid changes to protect and maximize their returns. A focus on managing the cost drivers, as well as proactive risk management and maximizing organization-specific value must take center stage.



## Setting up for success

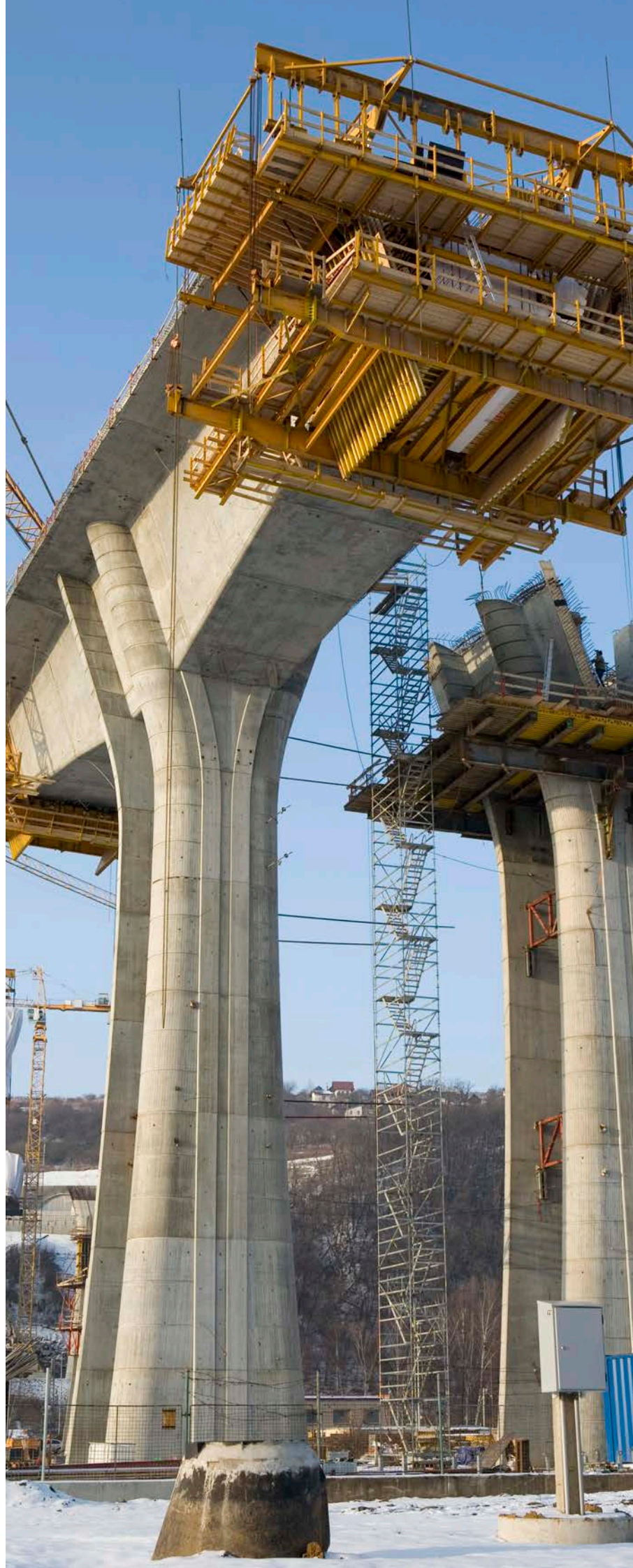
Globally, all these issues contribute to a shifting and uncertain future. To successfully navigate the turbulent waters ahead, business should consider the following practices.

In this climate, it is vital that businesses are open-minded and inquisitive so as to fully understand their supply chain strength. Though insolvencies have been limited over the last two years, it is likely they will become more common. We are already starting to see this filter through, with Australia's major A\$1.4bn contractor, Probuild, collapsing in February 2022.

In an inflationary market, organizations must be laser-focused and work hard to manage costs, remove waste, and renew efforts to increase productivity. A thorough interrogation of the supply chain can reveal a string of innovative capabilities that may have previously gone unnoticed, particularly regarding sustainability agendas. Here, under-utilized solutions, such as modern methods of construction, could help reduce material waste, as well as time and labor input.

Alongside this, businesses will need to adopt a pragmatic mentality. As our country-specific deep dive later in this report highlights, flexibility around timescales will be key as access to resources – human as well as material – may increasingly dictate program timescales. Australia, for example, is forecasting a severe shortage of construction workers. Vacancies in the country have already increased by 80% since late 2019. Singapore and Germany are also expecting workforce pressure to intensify, with German contractors claiming 50% of open positions for skilled labor can't be filled. At the same time, the sector must be agile and quick in its ability to respond to changing supply chain circumstances, particularly in relation to pricing, where suppliers may only be able to hold prices for a short window of time.

To make projects more equitable, economic and certain, sharing risk will be critical. In some cases, this means all parties must be willing to recognize that predicting and managing cost risk from certain materials can be difficult given supply chain challenges. Some clients may benefit by sharing cost risk to avoid upfront costly premiums, but the construction supply chain also needs to recognize that clients need outcome certainty, and to hit certain cost points to deliver successful results.





## Doing more with less

With limited resources, it is vital organizations find more efficient means to deliver their plans. For example, looking at technological solutions that reduce labor levels while opting for sustainable materials to lessen environmental impact. These changes aren't always cheap, so it is important that clients consider the value of the full project lifecycle, rather than the cost of short-term returns.

The current materials-led inflation cycle is already biting across many markets, with countries like Germany experiencing inflation because of reduced access to steel and timber. Combining the economic pressure of resource scarcity with sustainability goals stresses the importance of doing more with less.

This places a fresh challenge on clients to view their approach to project delivery through a different lens – and front and center is the robust assessment of whether a project's whole-life cost weighs up to its true benefits.

It is becoming ever more imperative that the sector re-evaluates how it defines value. Short-term gain around capital cost reduction, for example, could end up costing more in the long-term, so a more sophisticated assessment of value could better deliver a project fit for the future. This will consider both capital and operational costs, as well as current and predicted consumer trends that might require a long-term investment in adaptability so that an asset can be put to different uses.

While there will always be short-term issues that need to be resolved, companies that keep an eye fixed on the longer term will be well positioned to navigate future challenges. The sustainability agenda is central to this approach and requires all companies to start thinking outside the box, particularly as world governments begin to introduce tougher sustainability measures in their pursuit to reach net-zero by 2050.

Carbon pricing, for example – effectively a tax on non-sustainable materials – will increasingly factor into client decision-making in the medium- to long-term. The price of carbon in Europe peaked at €97/ton in February before the Ukraine crisis, 100% above levels seen in Spring 2021, and adding €200 to the cost of a ton of steel. In addition to incentivizing investment in low-carbon manufacturing, higher carbon costs could also prompt a positive shift in design thinking. Clients might, for example, be challenged to rethink their design, such as opting for retrofit or material reuse rather than demolition or the sourcing of new, scarce materials.

An example of this smart design in action can be seen across CIT Group's UK-based Hylo scheme – a £140m commercial project in London delivered by Arcadis, contractor Mace, and structural engineer AKTII. The team used an innovative design to retain a large proportion of an existing main tower structure whilst increasing overall floor space with a new vertical extension.

By keeping significant amounts of the superstructure framing, basement and foundations, hundreds of tons of concrete and steel were retained and far less new material was used. This resulted in a quicker program involving fewer deliveries and onsite hours, lower costs and less impact on the local community.

Another critical factor underpinning the sector's resource scarcity and sustainability agenda is for companies to make better use of available digital products and solutions. By harnessing the power of data to develop a deeper understanding of their buildings, buildings can become more energy and cost-efficient.

Collecting and applying building data can have multiple benefits when it comes to sustainability goals and efficiency. In the UK, Arcadis has joined forces with a technology partner, Demand Logic, to deliver 30-day digital audits of buildings to analyze trend profiles of a building's performance and energy waste, and to develop a comparative benchmark analysis. The data analysis finds operational inefficiencies and suggests quick-win solutions to save on running costs and lower carbon emissions by tweaking the building's systems. For example, by analyzing trends we can see when power is being used out of hours, on floors that are not occupied, or where heating and ventilation are not being used effectively.

Ultimately, the opportunities to adapt to new market conditions are there and can produce significant competitive advantage if deployed effectively. By getting ahead of future trends as well as utilizing information and products that are already on the market, there is a real chance to drive change and create more value from less. This can come from an asset perspective, but also regarding social and sustainability benefits, leading to a greener, more efficient and considerate industry.

If organizations aim to successfully navigate the pressures felt across global markets, then they must be open-minded and adaptable in the face of challenges ahead. This will not only deliver benefits to their organization and supply chain but ensure that our buildings and infrastructure are fit for future generations.

Mjøstårnet, Norway



# A practical guide to navigating today's market volatility

## Why you need this guide

Global markets are currently experiencing unprecedented levels of uncertainty and volatility. The aftermath of COVID-19 has caused serious inflationary pressures that are being felt throughout the supply chain, making it harder than ever to predict cost and project timelines.

This, of course, creates a much riskier environment that clients must navigate and with one eye on the future – including delivering critical sustainability targets and finding a route around any potential consequences the Ukrainian crisis will bring.

This guide has been designed against this backdrop: a tool to help assess how well positioned clients are to tackle the immediate challenges ahead. Below are a series of touchpoints and checks that clients can use to discover how prepared they are to successfully deliver their project in today's climate.

A practical guide to navigating today's market volatility

01

**Supply chain resilience**

02

**Project resilience**

03

**Project optimization**

04

**Team culture**

05

**Leadership and management plan**

**01**

## Supply chain resilience

- **Direct sanction impact** – companies may need to review links with suppliers if sanctions are extended, meaning alternative sourcing plans need to be put in place.
- **Financial health** – COVID-19 after-effects could be exacerbated by the Ukraine crisis, meaning companies should have sufficient reserves and should test the financial strength of their supply chain, including assessing their wider contracts.
- **Transparency** – companies must ensure their supply chain meets updated supply chain expectations regarding ownership, funding, and materials sourcing.

**02**

## Project resilience

- **Single point of failure** – companies must identify supply chain risks that might delay or disrupt a program, such as semi-conductor availability, supplier failure or critical contractors, for example M&E specialists or MMC pod manufacturers.
- **Contract resilience** – businesses should consider to what extent supplier cost risks are locked down to protect both themselves and their suppliers.
- **Procurement resilience** – companies should consider using a shell and core/fit-out procurement strategy to reduce longer-term risks associated with cost/program, as well as early design lockdown on certain elements.

**03**

## Project optimization

- **Team optimization** – companies can't afford to carry waste and must maintain a sharp focus on cost by keeping things as lean and efficient as possible, for example by minimizing role duplication.
- **Design optimization** – companies should adopt a 'less is more' approach to materials. A sharp focus on design economics and circular economy principles will reduce costs and support longer-term sustainability objectives.
- **Design fixity, quality, and maturity** – businesses must ensure their design concept is sufficiently worked through to enable their supply chain to build as intended and to ensure changes are kept to a minimum.

**04**

## Team culture

- **Behaviors** – companies should implement an active problem-solving culture and be prepared to handle uncertainties. Collaboration, aligned objectives, and transparency are key.
- **Practical measures** – businesses need to ensure prompt payment, fast decision making to mitigate risk, and accurate, efficient record keeping.
- **Workforce** – companies must foster a supportive working environment to attract and retain talent. Scarcity of labor and skills shortages put more pressure on existing teams, while concerns around energy costs, inflation and mental fatigue all add additional strain.

**05**

## Leadership and management plan

- **Leadership matters** – recent global crises have demonstrated the difference that excellent, consistent and inspiring leadership can make.
- **Scenario planning** – companies should work with their project team to plan for a more complex business environment, focusing on aspects such as materials, people, COVID-19, and business failure.
- **Crisis response plan** – with rapidly changing geopolitical conditions, companies should ensure this is constantly updated to react to the latest circumstances.



# Construction around the world

A deep dive into a select group of markets which have shown noteworthy changes and initiatives during the last year.



*“Construction has largely recovered from the pandemic, but that recovery is coming with an inflationary cost. Skills shortages will only get worse, and this will become the challenge of the decade. Businesses that invest in the industry’s transformation will find themselves in a market-leading position in an industry that underpins the Australian economy.”*

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Matthew Mackey, Australia

## Asia - Pacific

### Australia

In Australia, the post-COVID economic recovery is ongoing, and has been delayed by one of the world's toughest lockdown regimes. It is clear that the management of the pandemic by Australian authorities has resulted in a relatively brisk bounce back. However, delayed growth has translated into a slower than expected recovery in the construction sector. Over the past year, a weak work pipeline has resulted in a very competitive projects market, with little inflation being passed to clients. Workload is now returning, driven by the commercial, industrial and residential markets, with a particular focus on data centers and institutional rented housing. While public investment works are not yet in full swing and are a work in progress, planned infrastructure investments are likely to put even more strain on resources translating to further inflationary pressure.

In the future, a severe shortage of construction workers will present a huge challenge to the industry. Construction vacancies have increased by 80% since late 2019, and by 2023 there will be over 100,000 unfilled roles in construction. This will be almost 50% greater than the number of people who are expected to be qualified to fulfil them. As confidence returns to the construction sector, it urgently needs to focus on becoming a more resilient industry investing in digital, modern methods of construction and practical measures to improve sustainability.



### Hong Kong

Hong Kong saw relatively low levels of price inflation during 2021. The construction sector cooled in the first half of 2021. Due to the pandemic, both consents and commencement of domestic and non-domestic work in the first half of 2021 dropped substantially compared with the second half of 2000. With the resumption of a normal approvals process, the outlook for new orders has been improving. But the prospects for both ongoing and new projects is still challenging, with the former experiencing delays due to limited access to materials imported from Mainland China, and the latter still exposed to elevated materials prices.

COVID-19 continues to create challenges. At the time of writing, Hong Kong is still subject to COVID restrictions, and the supply of materials has sometimes been disrupted when mainland cities have entered lockdown. Contractors have also had to absorb substantial materials cost inflation during 2021.

Going forward, the public sector is going to be the main growth driver, with the value of approved funding in the past two years having increased by around 40%. With potential constraints to the availability of migrant labor, there is a strong drive to adopt modern methods of construction across all industry sectors. Planning processes have been adapted to accommodate the design for manufacturing approach. There is also a strong incentive for contractors to introduce innovative proposals, as they will be awarded higher quality scores as part of the tendering process.



*“Looking ahead to 2022, we can be cautiously optimistic about the level of construction activity in both the private and public sectors. This is because of positive signs in 2021, which include a growing number of consents in the private sector, increased funding for public works, and the government’s priority for increased public and private housing supply.”*

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*Francis Au, Hong Kong*



*“There has been a long-term aim to increase the productivity of industry in Singapore. New measures to encourage contractors to employ high-skilled workers and increase the use of modern methods of construction are a welcome step, but in the short-term, labor pressures are expected to intensify.”*

*Josephine Lee, Singapore*



## Singapore

Singapore bounced back strongly during 2021. Total construction demand grew by 42%, following a decline of nearly 40% in 2020. Recovery during 2020 had been held back by the industry’s COVID-Safe Restart Criteria and difficulties associated with bringing foreign labor into Singapore during the pandemic. During 2020, steps were taken to protect the construction sector with the COVID-19 (Temporary Measures) Act, which required clients and their supply chains to share costs and other contractual risks. This has left the construction supply chain in good shape to deal with a rapid recovery, but it did not prevent a significant wave of construction inflation during 2021.

The outlook for 2022 looks promising with a strong pipeline worth between S\$27bn and S\$32bn; similar to 2021. The public sector will be a key client during the recovery, providing 60% of total construction demand, mainly through public housing and large infrastructure investments, such as the Cross Island Line (Phase 1) and Sengkang Punggol Light Rapid Transit (LRT) Depot Expansion.

To ensure successful delivery, Singapore needs to tackle a serious labor shortage, which has been amplified by restrictions on foreign workers since 2020. Projects are already affected through slower programs and higher costs. New measures are being introduced to incentivize the recruitment of foreign workers with higher skill levels. From 2024, contractors will only be able to recruit five foreign workers for each local employee. A new employment levy structure framework will also encourage more offsite work.



## Mainland China

The Chinese construction market was worth over \$1.1tn in 2021. Growth continued throughout the pandemic due to the decisive management of outbreaks as they emerged. Continuing growth has been supported by investment in infrastructure in small and medium sized cities. The commercial sector also did well with particularly high levels of investment from the tech sector in many cities, along with some retail and grade A office development. The residential sector had a more difficult year. There is a genuine need for new housing, but the market slowed as authorities took action to stabilize some heavily indebted developers. New measures, including smaller deposits and lower mortgage rates, should stimulate demand.

Chinese construction markets were exposed to moderate inflation of around 5% during 2021. As a result of the pandemic, the labor resources in first-tier cities were in a slight shortage, and price rises were driven mostly by soaring material costs. There were occasional disruptions to projects caused by COVID-19 related lockdowns, albeit these affected isolated cities rather than the entire market. 2021 saw the launch of the 14th five-year plan. Major initiatives in the plan with implications for construction markets include a major push for carbon neutrality, a target to increase common prosperity by having 65% of the population living in cities by 2025, and a commitment to the protection of biodiversity in pursuit of building an 'ecological civilization'.



*“Having declared that it will ensure that carbon emissions reach their peak no later than 2030 and that the country will achieve carbon neutrality by 2060, the construction of green buildings is critical for China. On top of this, at the end of 2021, the Chinese government announced that real estate will remain a critically important industry, which has contributed to projected stability in the country’s construction market in 2022.”*

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*Joe Chan, Mainland China*



## Europe

### United Kingdom

UK construction completed its recovery from COVID-19 by late 2021, but had changed shape significantly, with dynamic growth in both large-scale infrastructure and small-scale domestic home improvements. The UK's infrastructure investments are spearheaded by the Hinkley Point Nuclear Power Station and High Speed 2, where spend will really start to accelerate from 2022 onwards. The UK's building contracting sector has seen mixed fortunes. The logistics and industrial sub-sectors are booming despite long lead times for critical steel products, whereas commercial and public sector building development is slow, helping to keep construction markets competitive.



Inflation has been a big challenge for clients across the industry, although small-scale construction has been most exposed to extreme fluctuations in material prices. House-builders have been cushioned from inflation by long-term materials purchase agreements, and house price inflation and many commercial projects have been protected by fixed-price contracts. Inflation accelerated rapidly in the second half of 2021, and contractors that had not fixed their prices with their suppliers have come under significant price pressure. Inflation on competitively tendered projects is around 5-6%, but total inflation is much higher, and some increased cost is being absorbed by the supply chain.

Markets have been buoyant during 2021 and contractors have a much healthier pipeline of work than they did 12 months ago. This has reduced competitive pressure a little, although project teams are still focused on making sure that projects are viable as well as profitable. 2022 and 2023 should see public sector programs associated with mobility, health and education accelerate, adding further to an already busy sector. These long-term programs will give project teams much needed certainty on which they can focus investments in innovation and low-carbon processes and materials.



*“The UK Government promised to ‘build back better’ at the height of the pandemic and current high levels of investment in design and procurement for rail, highways, hospitals and schools promise a bright future for the construction sector. Private investors are also demonstrating confidence in the future of cities, with a wave of projects aimed at the low-carbon market.”*

*Peter Hogg, UK*



## Belgium

The Belgian construction market was booming throughout 2021 and according to EUROSTAT data, output grew by 7%. However, recovery came at a cost, and limited access to construction materials, including steel and timber, has caused many delays. While these materials are now more readily available, prices are still high. In the aftermath of problems during 2021, many projects are now focusing on program recovery and minimizing any further overruns. On existing projects, contractors are exposed to increased costs that exceed the value of contractually defined inflation adjustments. For new projects, inflationary pressures and increased risk premiums affect viability.

EUROSTAT forecasts that over the next couple of years, growth in Belgian construction markets will slow, with 2% growth in 2022, and 1% in 2023. Moderate growth will take away some pressure from price inflation but will not eliminate all input cost pressures associated with labor and materials. In particular, mega projects including the €3.35bn Oosterweel ring road project in Antwerp will create even more competition for resources over its 10-year duration. Part of Belgium's €5.9bn COVID recovery will be spent on low-carbon renovation, low-carbon energy and enhancing natural habitats.



*“Belgium’s last major infrastructure construction boom took place in the 1970s. Today, latest initiatives to improve Belgium’s cities and networks will need to integrate sustainable thinking focused on minimizing the use of materials. This will keep costs and environmental impacts under control.”*

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*Ann Van Melkebeek, Belgium*



## France

2021 saw a strong recovery from Europe's deepest COVID-19 economic contraction. Construction output fell by 65% at the peak of France's lockdown, but recovered during 2021. Output is forecast to grow by 3% in 2022, after bouncing back by 12% the year prior. Yet the recovery has not been without its challenges, including a mismatch between supply and demand and Europe-wide problems associated with accessing skills and materials. Circumstances improved towards the end of 2021, with activity increasing at the fastest rate since summer 2020.

In response to very challenging markets, public sector clients took the unusual step during 2021 of providing contractual relief on a case-by-case basis with respect to delay penalties and some cost increases. Projects like 2024 Paris Olympics took specific measures to control and secure schedules and costs by anticipating much more strategic supply needs such as steel and wood.

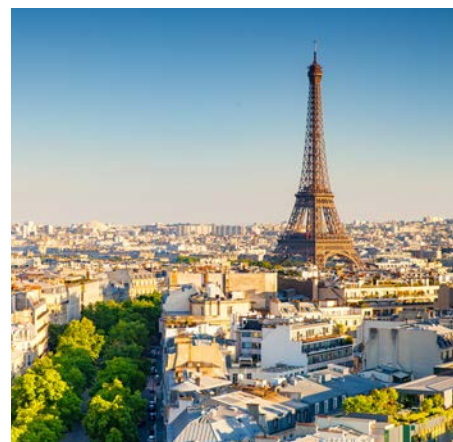
France has a series of long-term investment programs aimed at becoming more sustainable, resilient and better prepared for the challenges and opportunities arising from the emerging green and digital agendas. These include the Big Investment Plan worth €57bn, which will complete in 2022, and France's €39bn share of the European recovery fund, which will support programs including the decarbonization of existing building stock and investments in the modernization of the railway and will further support the development of green hydrogen.

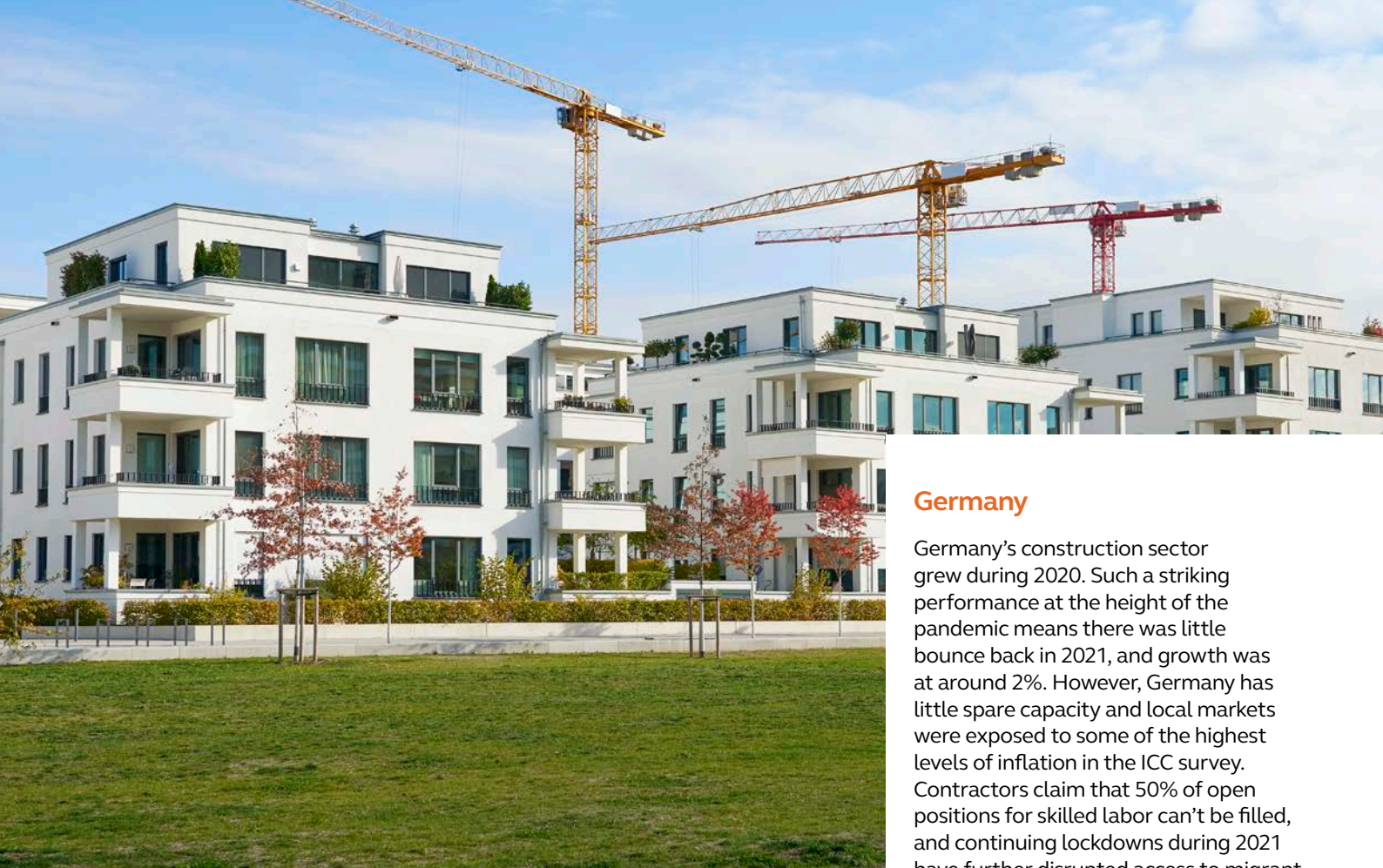


*"The recovery was strong in 2021, particularly in Paris, driven by national growth of nearly 8%, a recovery plan largely dedicated to the construction and transport sector, as well as a resilient real estate sector, which is back to almost 2019 levels. However, the outlook for 2022 is still relatively uncertain, given the global geopolitical situation and pressures on the supply chain."*

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Nicolas Boffi, France





## Germany

Germany's construction sector grew during 2020. Such a striking performance at the height of the pandemic means there was little bounce back in 2021, and growth was at around 2%. However, Germany has little spare capacity and local markets were exposed to some of the highest levels of inflation in the ICC survey. Contractors claim that 50% of open positions for skilled labor can't be filled, and continuing lockdowns during 2021 have further disrupted access to migrant labor. With new orders in December 2021 increasing by 12% compared to the previous year, prospects are good – but will be difficult to deliver.

The residential market is the most important segment of the German construction market. The recently elected new government is seeking to prioritize the development of housing, including 100,000 affordable homes. Whilst housing development has been brisk in recent years, developments in connection with subsidies might slow markets down. For example, the BEG (low-energy housing program) fund has been closed to new applications in January 2022.

Another positive development for the sector is the further acceleration of the government's long-term €270 bn program aimed at the renewal of Germany's long-neglected transport infrastructure. Major investments in Berlin and Hamburg include the I2030 program extending eight rail connections in Berlin and the replacement of the iconic Kohlbrand Bridge in Hamburg. The "traffic light" coalition is committed to investment in public works, so further opportunities should emerge.



*“Supply shortages of building materials are forcing a rethink in materials management. Instead of demolition, clients are analyzing whether their existing assets can be reused. If this is not possible, then we are seeing a much wider application of circular economy principles, looking at how many materials can be reused.”*

*Birgit Detig, Germany*



*“As Dutch cities recover from the pandemic, there is greater interest in the quality of green and blue infrastructure and how this contributes to providing attractive and healthy public space. Alongside the decarbonization agenda, public authorities are also giving more attention to the upkeep of aging assets, including the ‘Bridges and Quay Walls’ Program in Amsterdam.”*

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*Verali von Meijenfeldt,  
the Netherlands*

## The Netherlands

The Dutch construction sector worked throughout the pandemic and has continued to perform well. Current workload is high, at around €120bn. This has been supported in part by a U-turn on measures to control nitrogen pollution, which had delayed a significant amount of development in 2019 and 2020 and caused many delivery challenges. In addition to pressures around construction materials, labor shortages have been a major problem, caused by travel restrictions on migrant workers and COVID isolation rules. Labor shortages have become such a limiting factor that ABM AMRO claim that 20% of construction firms have turned down projects. Interestingly, the Netherlands has not applied for EU COVID recovery funding – possibly because the economy is running well enough without the added stimulus.

As described, the market is booming across diverse sub-sectors, and is expected to grow by 5% in 2022. Residential work especially is in high demand, driven by a combination of factors, including the need to increase existing housing stock by another 1 million homes by 2030, ensuring it is well connected to public infrastructure improvements, and the need to retrofit in line with net zero requirements. Sustainability and net-zero are at the top of the agenda across all building typologies, with the Netherlands being a pioneer in the implementation of sustainable solutions and the circular economy at a large scale.

## North America

### United States

The US construction market is worth \$1.5 trillion, but so far, the recovery from COVID-19 has been mixed. COVID-related restrictions caused uncertainty during 2021, which was reflected in a decline in workload across the commercial sector. At the same time, the Infrastructure Bill was delayed. Despite this, infrastructure workloads remained steady, supported by state- and city-level recovery initiatives such as the 6-year \$45bn Reinvest Illinois Capital Plan. In contrast, the US house-building sector had its busiest year since the financial crisis, with over 1.7 million residential permits being issued; up 25% compared to 2019.

Even though overall growth in construction activity was modest, the US experienced some of the highest levels of inflation recorded in the ICC survey.

Almost every project was exposed to these problems, requiring extreme measures including early design freezes and accelerated procurement. Such solutions were only suitable for clients capable of managing the altered risks that follow a forced program acceleration.

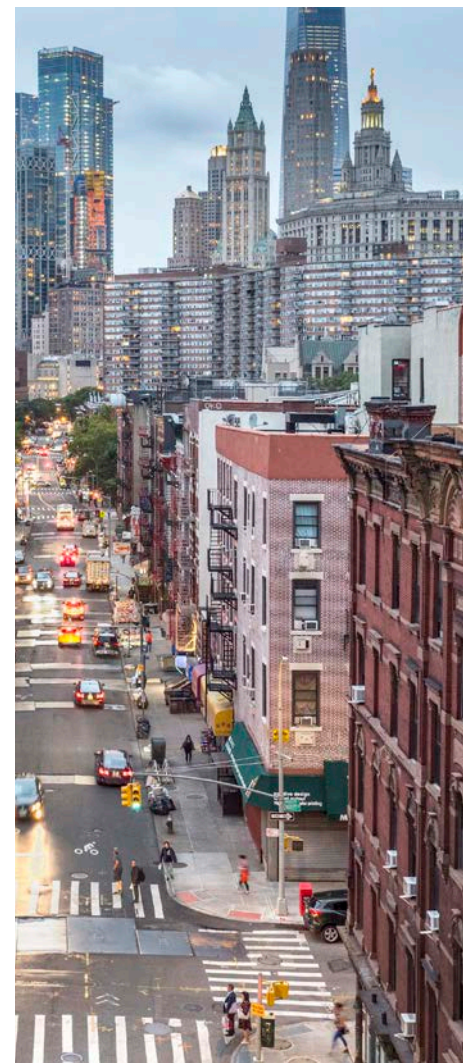
Prospects for 2022 look better. COVID restrictions are being lifted, investor confidence is returning, and material prices are declining. Some decisions on infrastructure investment are also expected to be made ahead of the mid-term elections. Supply chain and labor risks are still significant, but overall, project teams are proceeding with plans to mitigate these risks with cautious confidence.



*“While every local market has its own individual challenges, worker shortages and supply-chain issues are plaguing construction projects across the country. Though some developers plan to limit production rates, creative, sustainable building strategies are critical for the US to address increasingly dire housing shortages and rapidly increasing costs.”*

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LeAnn Tomas-Foster, North America





## Methodology

Arcadis developed its comparative cost index for 100 cities, covering 20 building functions, based on a survey of construction costs, review of market conditions and the professional judgement from its global team of experts. Ranges of indicative prices for each building function are collected for each city. Low and high range costs are converted into US Dollars (USD), normalized and indexed against the price range for each building type for Amsterdam, where Amsterdam = 100. Average low and high index ranges are calculated for each city based on the 20 building types.

The data was collected in the first quarter of 2022. Analysis was undertaken prior to the conflict in Ukraine, and the potential impacts of the invasion on the construction markets are not included.

Costs used to calculate the index are based on buildings delivered to local specification standards, meeting both functional requirements and quality expectations. As a result, the index compares the relative costs of delivering the same building functions in a city, it also reflects the different levels of quality expectation reflected in a specification.

The index does not take into account purchasing power parity. The construction cost data used in the index is current as of 1st quarter 2022. The exchange rates used to calculate the index were current on 9th February 2022.

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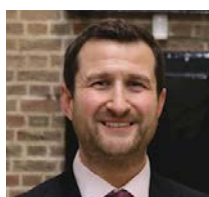


## About Arcadis

Arcadis is the leading global Design & Consultancy firm for natural and built assets. Applying our deep market sector insights and collective design, consultancy, engineering, project and management services we work in partnership with our clients to deliver exceptional and sustainable outcomes throughout the lifecycle of their natural and built assets. We are 29,000 people, active in over 70 countries that generate €3.4 billion in revenues. We support UN-Habitat with knowledge and expertise to improve the quality of life in rapidly growing cities around the world.

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