constructsteel

Monthly update for the construction industry
March 2022

Construction market trends

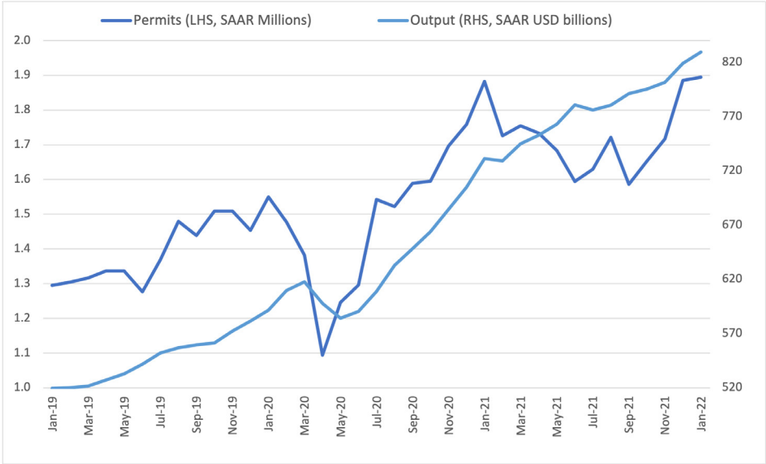
United States

Residential and non-residential output strong but bottlenecks and rising mortgage rates could slow demand.

Private residential output up 1.3% m-o-m (13.4% y-o-y); building permits up 0.5% m-o-m (0.6% y-o-y) to 1.899 million units & highest since 2006.

Private residential construction output vs private permits

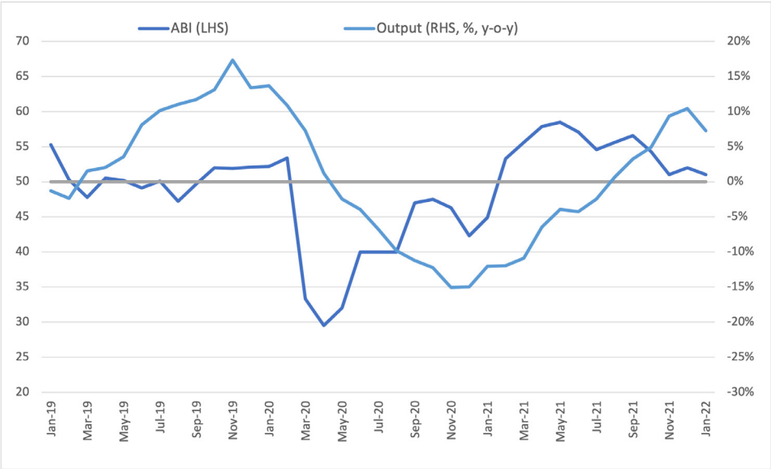
Source: US Census, American Institute of Architects



Private non-residential output up 1.8% m-o-m (7.3% y-o-y). Architecture Billings Index (ABI) fell to 51 in January from 52 in December (>50, expansion).

Private non-residential output vs Architecture Billings Index (ABI)

Source: US Census, American Institute of Architects



Knowledge partner:
McKinsey & Company

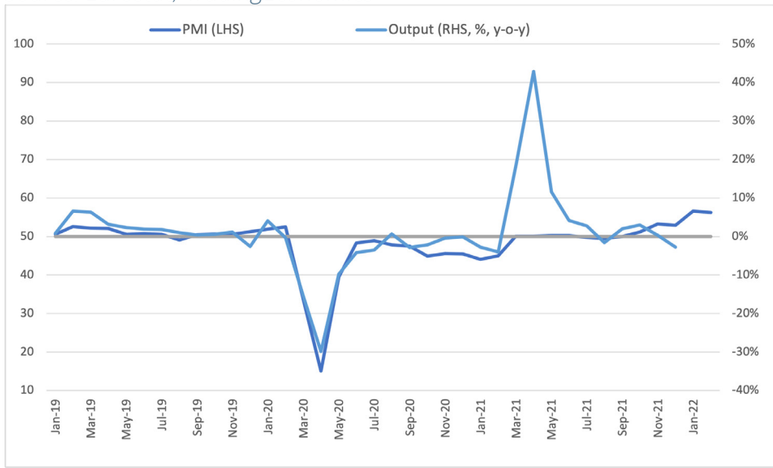
Europe

Improvement in construction driven by homebuilding & civil engineering but input cost inflation main risk to outlook.

Eurozone construction down -4% m-o-m (-2.8% y-o-y). The IHS Markit Eurozone Construction PMI fell slightly to 56.3 in February from 56.6 in January (> 50, expansion).

Eurozone construction output vs PMI

Source: Eurostat, TradingEconomics



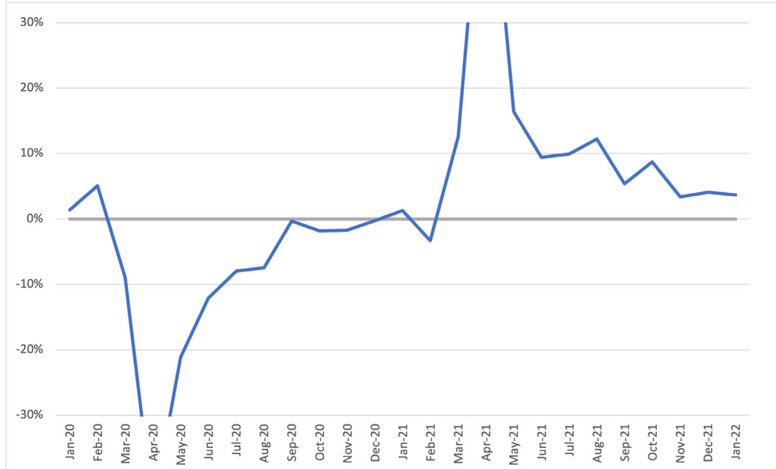
India

Core sector growth slowed but remains stable.

Weighted average of eight core industries output up 3.7% y-o-y in January; production of steel up 2.8%; cement up 13.6% y-o-y.

Weighted average of eight core industries industrial production (%, y-o-y)

Source: Ministry of Commerce & Industy, India



Special topic: The Sustainable Buildings Research Centre – A holistic approach to sustainable buildings

Resilient Building Design and Construction | Steel Australia Summer 2021-2022

The Sustainable Buildings Research Centre at the University of Wollongong is a multi-disciplinary facility designed to address the challenge of transforming our buildings and built environment into sustainable, resilient and effective places for people to live and work. Buildings have major economic, environmental and social impacts on the community and the planet.

IMAGE: The Sustainable Buildings Research Centre. Image credit: Paul Jones.

Between a quarter and a half of all greenhouse emissions result from the use of buildings. As such, the aim of the Sustainable Buildings Research Centre (SBRC) is to research, collaborate, and link with industry to meet the challenge of improving the performance of new and existing building stock. The SBRC is focused on making buildings more liveable, more sustainable, more cost-effective, and kinder to the environment. With research themes that range from sustainable and efficient energy usage, utilisation, generation and storage, through to human factors like health, comfort and wellbeing, the SBRC takes a holistic approach to buildings.

According to Professor Tim McCarthy (Director, SBRC), "The SBRC is interested in everything to do with sustainable building. The range of projects we work on is quite eclectic. We do everything from building bushfire resilience, re-engineering of more sustainable supply chains, and affordable heating and cooling. We've worked with the Illawarra Local Aboriginal Lands Council on the retrofit of a building to achieve net zero energy usage. We have a raft of projects on the power quality side of things. As the amount of renewable energy increases in the grid, it places stress on the old grid, and creates opportunities for new micro-grids on the energy provision side," said Professor McCarthy.

It comes as no surprise then, that the SBRC has access to a working micro-grid with standard and hybrid residential and commercial solar photovoltaics systems, spread across several buildings on the University of Wollongong (UOW) Innovation Campus. The micro-grid also includes small scale electrical and thermal energy storage, a plug-and-play distributed generation connection panel, 30kVA rated fully regenerative arbitrary waveform generator and passive adjustable load bank, a DC fast charger for electric vehicles, and extensive building submeter and portable instrumentation.

Living laboratories

As Senior Professor Paul Cooper explains, "Right from the very beginning the SBRC has had a focus on Living Laboratories that are able to test new systems and products. Our Living Laboratories include two Solar Decathlon Houses."

The Solar Decathlon is the world's largest sustainable architecture contest that challenges student teams to design and build highly efficient and innovative buildings powered by renewable energy.

The SBRC's first Solar Decathlon House is known as the Illawarra Flame House, and won the 2013 Solar Decathlon China Competition with a world record score. Following the competition in Datong (300km west of Beijing), the House was shipped back to Wollongong and has since been a unique test facility and Living Laboratory for the SBRC.

The House is used a research tool in many areas, from advanced HVAC and electrical energy systems control, through to moisture research in building envelopes.

The Desert Rose House—the UOW's second Solar Decathlon House—won second place in the Solar Decathlon Middle East Competition in November

2018. More than 200 students volunteered from the University of Wollongong and TAFE NSW, to take part in the Desert Rose House project—a net zero energy eco-friendly home that was architecturally inspiring, innovative and adaptive to a person's needs as they age.

The home's design takes into account the challenges people may encounter when living with dementia and other age-related disabilities. The unique features means the home will adapt to the occupant through the years, making it 'A House for Life'.

With hundreds of industry sponsors supporting both projects, including household names like Daikin and BlueScope, the teams were able to push the boundaries in design and purpose with industry mentors supporting and championing the various innovation initiatives.

Building insights facility

"One of our most exciting projects is the Building Insights Facility. The new Facility features a very large pair of climate chambers, which are unique in the Southern Hemisphere. There are only a couple of places in the world that have similar capabilities. The new

Facility allows us to work with clients that would previously have had to conduct tests overseas because this scale of facility just didn't exist in Australia before," said Professor McCarthy.

The Building Insights Facility is capable of measuring the thermodynamic, hygroscopic and environmental performance of large scale building elements. While the primary function of the Facility is the testing of facades, wall systems, and building envelope elements

on the outside of environmental chambers, its flexibility also enables efficiency testing of HVAC systems, and performance testing of indoor environmental quality, thermal comfort and air distribution systems.

"The Building Insights Facility links in with some of the work we will be doing in one of our major projects with the Steel Innovation Research Hub. We're working on a key project with BlueScope investigating the complex way that walls and roofs and the envelope of the building work in terms of heat transfer and condensation. The Facility will be key as we start to test innovative building systems. We are also involved in the Prefab Innovation Hub that is being funded through the Advanced Manufacturing Growth Centre (AMGC). Our role is to test the sustainability of modular and prefab buildings," said Professor Cooper.

"As part of the first Steel Innovation Research Hub, we worked on a project that looked at how steel can impact sustainability. We all know steel has a heavy carbon footprint. But, with its high strength to weight ratio and little waste, steel can be sustainable."

"The main issue with utilising steel is embodied carbon within a building. So, we looked at the use of light gauge steel for mid rise buildings. We found that using light gauge steel in a seven storey apartment block has about 40 per cent less mass than the concrete equivalent—this has a huge impact on embodied carbon and foundation design. In addition, because light gauge steel structural elements are effectively made by robots, there is little waste."

"Steel also has a very high recycling rate, which is essential because 'end of life' is a really big part of sustainability. We can even extract steel from reinforced concrete at the end of life. That circulatory is one of the important features of sustainability. With steel, you're not down-cycling—crushing it into a lower grade material—you can actually make it into fresh steel," said Professor Cooper.

Sustainable buildings research centre building project

The SBRC building project began when the UOW won a $25.1 million capital works grant from the Australian Government to build a new facility.

Once the funding for the project was established, the UOW leadership team developed a vision for the SBRC building, which was to be a 2,600m2 flagship facility for sustainability at the UOW. It was decided that, as the home of a centre of excellence for sustainable buildings, the design of the SBRC building needed to go well beyond the existing Australian sustainability benchmarks.

The choice of the Living Building Challenge (LBC) as the main sustainability framework for the design of the building was then a logical step to take. The LBC framework provided both the SBRC leadership team and the design team with a holistic way of approaching the challenge of delivering an outstandingly sustainable building, without being overly prescriptive and restricting the creativity of all involved.

Administered by the International Living Future Institute (ILFI),

IMAGE: The SBRC's Building Insights Facility.
Image credit: Paul Jones.

the LBC certifies projects that meet ambitious green building performance standards through a framework of seven 'Petals'—stringent performance standards and metrics covering energy use, site utilisation, health and happiness, equity, beauty, water and materials used. Living Certified buildings have met the criteria

for all seven petals. There are only 24 buildings in the world that have met all seven Petals and are considered Living Certified; an exclusive list that now includes the SBRC.

Living Certification under the LBC means the SBRC building is the:

- 1st Living Certified Building in Australia
- 24th Living Certified project in the world
- 3rd Living Certified project outside the United States
- 1st project in Australia to achieve any level of LBC certification

Senior Professor Paul Cooper said the research centre's design was based on the LBC regenerative design framework aimed at creating "restorative living, breathing" buildings that make a positive impact on our society and our environment overall.

"The building has been carefully designed to generate positive health and wellbeing through a restorative and healthy coexistence with nature, including the use of green walls and native plants, creating a strong connection between the building occupants and the landscape," said Professor Cooper.

"From day one, I said to the design team that we wanted to create a building that went way beyond the current benchmark for sustainable buildings. We believe society as a whole needs to do much better than that."

"The Living Building Challenge is widely recognised as the toughest sustainability framework for buildings. While the LBC is tough, it is extremely useful for building designers because it's not as prescriptive as some other sustainability frameworks. It has broad goals, but gives the designer a lot of leeway in terms of how to achieve those goals."

"The vision was that occupants, visitors and the general community could look back in years or decades to come, and know that the design of the SBRC stretched the boundaries of what was possible at the time of its design, and that this project represented a major step

forward in delivery of highly sustainable buildings. Here we are, a decade on from when the building was constructed, and it is still way out in front in terms of sustainability," said Professor Cooper.

The team used the LBC framework as a way to design and construct a building that is not just sustainable, but aims to be restorative.

"Sustainable means effectively you're not doing any net harm overall – but restorative means you're doing something that's addressing some of the environmental damage that has been done in the past," Professor Cooper said.

Water Petal

The approach to the Net-Zero Water Imperative has been to minimise water use and to meet this demand with captured rainwater, except where local health and safety regulations prescribe that potable water from the public water supply must be used.

The majority of the SBRC's water use is supplied by captured rainwater collected from the rooftops of the northern and southern buildings. This water is collected in a 65kL sub-surface tank located on the western perimeter of the site. Prior to use, the rainwater

from the tank is treated without the use of chemicals by filtration and ultraviolet sterilisation. This treated water is used

for showers, amenity hand basins, laboratory hand basins, cleaning purposes, PV wash-down, urinals and toilet-flushing. In anticipation of a precinct-scale grey water system, the SBRC water distribution is configured to allow toilets and urinals to switch from treated rainwater to grey water should the precinct system eventuate.

Materials Petal

The design team's architectural approach was always to do more with less. Every material and finish should work hard and do more than one job.

"The most significant factor was that we had to track every single item and material that came into the building as part of construction to make sure it complied with the requirements of the Living Building Challenge," Professor Cooper said.

"No 'red list' materials – formaldehyde, chromium, mercury, PVC, for example – are allowed during the building process. None of the materials or pieces of equipment or building elements were allowed to have red list materials unless an exemption has been given."

"There were also sourcing restrictions on the building materials, for example steel and concrete could be sourced from no more than 500km away, to limit 'embodied' carbon emissions and environmental impact due to transport of the construction materials to site,"Professor Cooper said.

Energy Petal

One of the main drivers to the design of the SBRC was energy. Almost all decisions came back to the energy budget and an enormous effort was spent on minimising the energy used on site. This included a strong focus on passive design and low energy heating and air conditioning, but also extended through to other items like sophisticated lighting control and 'green IT'. Energy targets were set very low and all building systems and user interaction needed to address those targets. Once this was achieved within the energy model

of the building, we were able to look to offsetting that consumption through on-site renewables. The SBRC facility has been constructed with a rooftop solar array to achieve net-zero energy on an annual basis. The facility has been designed to accommodate on-site battery storage. The installed solar array consists of three separate clusters and nearly 600 panels installed at different locations on the building.

A unique Photovoltaic Thermal (PVT) system was designed by industry partners BlueScope and the SBRC team and installed on the SBRC office roof. This 4 kWp electrical system was a pilot demonstration of how this technology could be retrofitted to existing buildings.

Air flowing under the thin-film PV panels is heated when the panels are exposed to the sun and this pre-heated fresh air is brought into the SBRC air handling system in colder months to provide renewable energy heating. In addition, the flow of air also cools the PV panels thereby increasing their electrical conversion efficiency.

The SBRC was one of the first buildings in this region to have a renewable energy system of a size which lay between small residential (≤15 kWp) and large-scale commercial systems (>30 MWp). The SBRC team collaborated with the electrical utility, particularly in the development of approval processes, to enable PV arrays of this intermediate scale to be accommodated.

The design of the SBRC roofs was driven in large part by the desire to make the 160 kW PV array particularly visible and attractive to the general community.

What is the living building challenge?

The Living Building Challenge is the world's most rigorous standard for green buildings. Going above and beyond LEED certification, Living Buildings strive for net-zero or net-positive energy, are free of toxic chemicals, and lower their energy footprint many times below the generic commercial structure.

To be certified under the Challenge, projects must meet a series of ambitious performance requirements over a minimum of 12 months of continuous occupancy. There are several types of certification under the Challenge: Living Building Certification, Core Green Building Certification, Petal Certification, Zero Energy Certification, or Zero Carbon Certification.

The Living Building Challenge is facilitated by the International Living Future Institute (ILFI): a not-for-profit organisation working to build an ecologically-minded, restorative world for all people. Using principles of social and environmental justice, ILFI seeks to counter climate change by pushing for an urban environment free of fossil fuels. In addition to the Living Building Challenge, ILFI runs several other programs: the Living Product Challenge, the Living Community Challenge, and the Reveal, Declare and Just labels. These programs develop a green framework for living in a 21st century world.

For more information, visit: living-future.org

Professor Tim McCarthy (Director, Sustainable Buildings Research Centre). / Image credit: Paul Jones

Technical trends:
Climate risk and the opportunity for real estate

McKinsey & Co., Real Estate Practice

Real-estate leaders should revalue assets, decarbonise, and create new business opportunities. Here's how.

Climate change, previously a relatively peripheral concern for many real-estate players, has moved to the top of the agenda. Recently, investors made net-zero commitments, regulators developed reporting standards, governments passed laws targeting emissions, employees demanded action, and tenants demanded more sustainable buildings. At the same time, the accelerating physical consequences of a changing climate are becoming more pronounced as communities face storms, floods, fires, extreme heat, and other risks.

These changes have brought a sense of urgency to the critical role of real-estate leaders in the climate transition, the period until 2050 during which the world will feel both the physical effects of climate change and the economic, social, and regulatory changes necessary to decarbonise. The climate transition not only creates new responsibilities for real-estate players to both revalue and future-proof their portfolios but also brings opportunities to create fresh sources of value.

The combination of this economic transition and the physical risks of climate change has created a significant risk of mispricing real estate across markets and asset classes. For example, a major North American bank conducted analysis that found dozens of assets in its real-estate portfolio that would likely be exposed to significant devaluations within the next ten years due to factors including increased rates of flooding and job losses due to the climate transition. Additionally, a study of a diversified equity portfolio found that, absent mitigating actions, climate risks could reduce annual returns toward the end of the decade by as much as 40 percent.

Leading real-estate players will figure out which of their assets are mispriced and in what direction and use this insight to inform their investment, asset management, and disposition choices. They will also decarbonise their assets, attracting the trillions of dollars of capital that has been committed to net zero and the thousands of tenants that have made similar commitments. They will then create new revenue sources related to the climate transition.

Building climate intelligence is central to value creation and strategic differentiation in the real-estate industry. But the reverse is also true: real estate is central to global climate change mitigation efforts. Real estate drives approximately 39 percent of total global emissions. Approximately 11 percent of these emissions are generated by manufacturing materials used in buildings (including steel and cement), while the rest is emitted from buildings themselves and by generating the energy that powers buildings.

In addition to the scale of its contribution to total emissions, real estate is critical in global decarbonisation efforts for reasons likely to be compelling for investors, tenants, and governments. Significant reductions in emissions associated with real estate can be achieved with positive economics through technologies that already exist. For example, upgrading to more energy-efficient lighting systems and installing better insulation have positive financial returns. Today, newer technologies also make low-carbon heating and cooling systems, such as heat pumps and energy-efficient air conditioning, more cost competitive in many markets and climates. These cost-effective upgrades can create meaningful change while also derisking assets.

McKinsey suggests three actions real-estate players can take to thrive throughout the climate transition:

- Incorporate climate change risks into asset and portfolio valuations. This requires building the analytical capabilities to understand both direct and indirect physical and transition risks.
- Decarbonise real-estate assets and portfolios.
- Create new sources of value and revenue streams for investors, tenants, and communities.

Fundamental changes brought on by the climate transition will open new dimensions of competitive differentiation and value creation for real-estate players. More important, leaders will make a valuable contribution to the world's ability to meet the global climate challenge.

Incorporate climate change risks into asset and portfolio valuations

Climate change's physical and transition risks touch almost every aspect of a building's operations and value. Physical risks are hazards caused by a changing climate, including both acute events, such as floods, fires, extreme heat, and storms, and chronic conditions, such as steadily rising sea levels and changing average temperatures. Transition risks include changes in the economy, regulation, consumer behaviour, technology, and other human responses to climate change.

Physical and transition risks can affect assets, such as buildings, directly or indirectly, by having an impact on the markets with which the assets interact. A carbon-intensive building obviously faces regulatory, tenancy, investor, and other risks; over the long term, so does a building that exists in a carbon-intensive ecosystem. For example, a building supplied by a carbon-intensive energy grid or a carbon-intensive transportation system is exposed to the transition risks of those systems as well. All these changes add up to substantial valuation impacts for even diversified portfolios—an increasingly pressing concern for real-estate companies.

Physical risks, both direct and indirect, have an uneven effect on asset performance

Several major real-estate companies have recently conducted climate stress tests on their portfolios and found a significant impact on portfolio value, with potential losses for some debt portfolios doubling over the next several years. Notably, they found significant variation within the portfolios. Some assets, because of their carbon footprint, location, or tenant composition, would benefit from changes brought on by the climate transition, while others would suffer significant drops in value. The challenge for players is to determine which assets will be affected, in what ways, and how to respond. There is also opportunity for investors who can identify mispriced assets.

Direct physical consequences can be conspicuous: the value of homes in Florida exposed to changing climate-related risks are depressed by roughly $5 billion relative to unexposed homes. According to the Journal of Urban Economics, after Hurricane Sandy, housing prices were reduced by up to 8 percent in New York's flood zones by 2017, reflecting a greater perception of risk by potential buyers. In California, there has been a 61 percent annual jump in non-renewals of insurance (due to higher prices and refused coverage) in areas of moderate-to-very-high fire risk.

The indirect impacts of physical risk on assets can be harder to perceive, causing some real-estate players to underestimate them. For example, in 2020, the McKinsey Global Institute modelled expected changes in flooding due to climate change in Bristol, England. A cluster of major corporate headquarters was not directly affected, but the transportation arteries to and from the area were. The water may never enter the lobby of the building, but neither will the tenants.

The climate transition will affect both individual buildings and entire real-estate markets

The investments required to avoid or de-risk the worst physical risks will drive a historic reallocation of capital. This will change the structure of our economy and impact the value of the markets, companies, and companies' locations. These momentous changes require real-estate players to look ahead for regulatory, economic, and social changes that could impact assets.

Among the most direct climate-transition impacts are regulatory requirements to decarbonise buildings, such as New York City's Local Law 97. In June 2019, the Urban Green Council found that retrofitting all 50,000 buildings covered by the law would create retrofit demand of up to $24.3 billion through 2030. Standard property valuation models generally do not account for the capital costs required for a building to decarbonise, and investors and operators are often left with a major capital expense or tax that wasn't considered in the investment memo.

There is also a host of less direct but potentially more significant transition risks that affect whole markets. For example, some carbon-intensive industries are already experiencing rapid declines or fluctuations. In Calgary, for example, the combination of oil price volatility and market-access issues (driven by climate change–related opposition to pipelines) has dramatically depressed revenues from some buildings. Vacancy rates in downtown Calgary reached about 30 percent, a record high, as of January 2021. Investors exposed to the Calgary market have seen their asset values drop precipitously and are left trying to either hold on and hope for a reversal of fortunes or exit the assets and take a significant loss.

Physical and transition risks have direct and indirect implications for revenue, operating and capital costs, and capitalization rate.

Implications of transition and physical risks, by direct and indirect effects

	Transition risks: Include changes in the economy, regulation, consumer behavior, technology, and other human responses to climate change		Physical risks: Hazards caused by a changing climate, from floods, fires, and storms to rising sea levels and changing average temperatures	
	Direct effect	Indirect effect	Direct effect	Indirect effect
Revenue	Unattractiveness of a carbon-intensive asset to an occupier that has made a climate commitment	Decline in a sector or local economy resulting in lower local real-estate demand/occupancy	Disruptions to an asset's operations from severe or repeated physical-hazard events (eg, major floods)	Reduced real-estate demand in a local market given disruptions to surrounding transportation or other infrastructure
Operating costs	Increased utility costs given carbon-intensive building systems	Carbon charges on an asset given local regulations	Increased maintenance costs as physical risks increase	Increased insurance costs as insurers recognize physical risks and adjust underwriting models
Capital costs	Significant capital investment required to meet local energy efficiency/emissions standards or tenant demands (eg, early retrofit of heating/cooling systems), increased need to purchase lower-emissions building materials (eg, steel, cement, timber)	Increased financing costs as investors and lenders price in market-level transition risks (eg, in economies dependent upon carbon-intensive industries)	Investment required to improve the resilience of building to increasing physical risks (eg, elevating lobby, green roofs, protecting electric and mechanical systems)	Increased capital investments (eg, development fees) required to protect broader communities from climate risks (eg, floodwalls, green infrastructure for heat mitigation)
Capitalization rate	Changes in capitalization rate due to perceptions of both physical and transition risks by market participants			

Real-estate players should build the capabilities to understand climate-related impacts on asset performance and values

Real-estate owners and investors will need to improve their climate intelligence to understand the potential impact of revenue, operating costs, capital costs, and capitalisation rate on assets. This includes developing the analytical capabilities to consistently assess both physical and transition risks. Analyses should encompass both direct effects on assets and indirect effects on the markets, systems, and societies with which assets interact (Exhibit 1).

Portfolio and asset managers can map, quantify, and forecast climate change's asset value impact

To understand climate change impact on asset values, landlords and investors can develop the following capabilities to understand and quantify risks and opportunities:

- Prioritise. Create a detailed assessment of the asset or portfolio to determine which physical and transition risks are most important and which are less important (using criteria such as the probability of a risk occurring or the severity of that risk).

- Map building exposures. Determine which buildings are exposed to risks, either directly (for example, having to pay a carbon tax on building emissions) or indirectly (for example, exposure to reduction in occupancy as tenants' industries decline because of a carbon tax), and the degree of exposure (for example, how high floodwaters would reach). This could require detailed modelling of physical hazards (for example, projected changes in flood risks as the climate changes) or macro- or microeconomic modelling (for example, projected GDP impacts based on the carbon price impact on a local geography's energy production mix).

- Quantify portfolio impact. Combine assessments of the economic risks on individual buildings into an impact map that enables visualisation of the entire portfolio (Exhibit 2). This requires combining knowledge of the potential risk or opportunity and an understanding of what drives the economics of a building (including drivers of net operating income, tenancy mix, and areas of cost variability).

- Take action. These capabilities cannot be isolated in a research or environmental, social, and governance (ESG) function but should directly inform investment management, lease pricing, capital attraction and investor relations, asset management, tenant attraction, development, and other core businesses. The processes within organisations must shift to ensure that climate-related insights can be a source of real competitive advantage.

A portfolio revaluation informed by climate change risks can lead to hard choices but will also open the door to acting on decarbonisation and exploring new opportunities.

Decarbonise buildings and portfolios

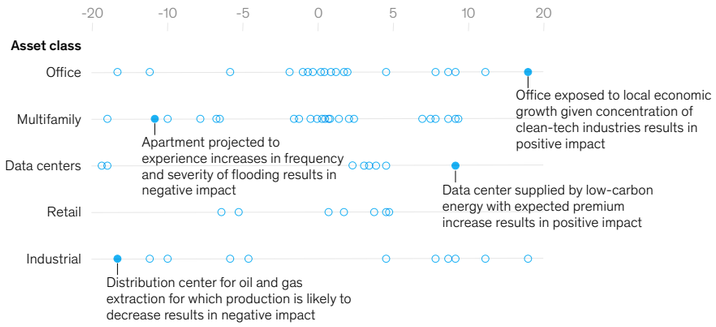
McKinsey research estimates approximately $9.2 trillion in annual investment will be required globally to support the net-zero transition. If the world successfully decarbonises, the 2050 economy will look fundamentally different from the current economy. If it doesn't successfully decarbonise, the world will experience mounting physical risks that will strain the foundations of the global economy and society. In either case, the places where people live, work, shop, and play will fundamentally change.

Decarbonising real estate requires considering a building's ecosystem

Ultimately, the only way to reduce the risks of climate change is to decarbonise. Real-estate players have a wide array of options for how to proceed, including low-carbon development and construction; building retrofits to improve energy efficiency; upgrades to heating, cooling, and lighting technology; and technology to manage demand and consumption. But decarbonisation is not solely a technical challenge. To develop the most appropriate path, real-estate players need to understand the range of decarbonisation options and their financial and strategic costs and benefits.

Real-estate owners and investors can assess the effects of physical risks and climate transition on the equity value of assets in a diversified real-estate portfolio.

Illustrative chart and examples of physical and transition risk effects on equity value of assets, %



Decarbonising real estate

To decarbonise, industry players can take the following steps:

- Understand the starting point. Quantify baseline emissions of each building. This helps real-estate players prioritise where to start (for example, individual buildings, asset classes, or regions) and determine how far there is to go to reach zero emissions.

- Set targets. Decide which type of decarbonisation target to set. There is a range of potential target-setting standards that take different approaches (for example, measuring absolute emissions versus emissions intensity, or setting targets at the sector level versus asset level). Players should develop a "house view" on targets that achieve business, investor, stakeholder, regulatory, and other objectives.

- Identify decarbonisation levers. Build an asset- or portfolio-level abatement curve. A marginal abatement cost curve provides a clear view of the potential cost/return on investment of a given emissions-reduction lever along with the impact of that lever on emissions reduction. This approach can be complemented with market and policy scenarios that change the relative costs and benefits of each potential abatement lever.

- Execute. Set up the mechanisms to effectively deploy the decarbonisation plan. These may involve making changes to financing and governance, stakeholder engagement (investors, joint-venture partners, operators, and tenants), and a range of operational and risk-management aspects of the business.

- Track and improve. As investors, lenders, and tenants make their own decarbonisation commitments, they will need to demonstrate that their real estate is indeed decarbonising. Thus, much of the value of decarbonising will come from the ability to demonstrate emissions reduction to potential stakeholders. Building the ability to monitor and progressively reduce emissions on the path to net zero will create an opportunity for players to differentiate.

Create new sources of value and revenue streams for investors, tenants, and communities

As the economy decarbonises, real-estate players can use their locations, connections to utility systems, local operational footprints, and climate intelligence to create new revenue streams, improve asset values, or launch entirely new businesses.

Opportunities include the following:

- Local energy generation and storage. Real-estate firms can use their physical presence to generate and store energy. For example, property developers have been outfitting buildings with solar arrays and batteries, helping to stabilise energy grids and reduce the costs associated with clean energy.

- Green buildings to attract more tenants. Developers and property managers can invest in developing green buildings or retrofitting older buildings to make them green to meet the growing appetite for sustainable workplaces and homes.

- Green-building materials. Players can explore the advantages of green steel, tall timber, modular construction, and other emerging technologies and materials that may have additional benefits, such as faster and lower-cost construction.

- Extra services on-site. Firms can introduce new revenue streams, including vehicle charging, green-facilities management, and other on-site services that enable occupants' sustainable preferences.

- Services for reducing and tracking emissions. Firms can support occupants by tracking emissions and offering solutions to reduce carbon footprints. These services could include smart sensors and tracking energy consumption through heating, cooling, lighting, and space management.

- Differentiated capital attraction. Given the volume of capital that has already been committed to achieving net zero, firms that are able to decarbonise will have an advantage in attracting capital. Real-estate players may, for example, create specific funds for net-zero buildings or investment themes that support community-scale decarbonisation.

The coming climate transition will create seismic shifts in the real-estate industry, changing tenants' and investors' demands, the value of individual assets, and the fundamental approaches to developing and operating real estate. Smart players will get ahead of these changes and build climate intelligence early by understanding the implications for asset values, finding opportunities to decarbonise, and creating opportunity through supporting the transition.

Real estate not only will play a critical role in determining whether the world successfully decarbonises but also will continue to reinvent the way we live, work, and play through these profound physical and economic changes.

Construction steel news headlines

construction market and regulations

Europe - Asia: France and China team up to build seven infrastructure projects around the world with a combined value of more than $1.7bn. This deal is a part of the two countries' Third-Party Market Cooperation agreement. Seven projects would be constructed in Africa, Southeast Asia and Central and Eastern Europe and would cover infrastructure, environmental protection and energy. Link

USA: Construction sector in USA needs more than half a million workers above its current pace of hiring in order to meet demand in 2022, according to an analysis released by Associated Builders and Contractors. Predictive models from ABC indicate the industry needs 650,000 additional workers. With many industries outside of construction also competing for increasingly scarce labor, the industry must take drastic steps to ensure future workforce demands are met. Link

Europe: The European construction sector is expected to grow by 2.5% in 2022, as a result of "fresh investment from the EU recovery fund, according to global economic analysis specialist ING. In its latest EU Construction Outlook report, the company said that despite price pressures, business confidence at the beginning of 2022 was positive among most contractors in the European Union, and back to pre-covid levels. Link

Europe: A new study has concluded that widespread adoption of cutting-edge technology has the potential to significantly aid the construction industry's efforts to cut carbon emissions, as well as increasing productivity and reducing project costs. The study concluded that an increase of around 20%, across all categories, was likely in the next five years. At the forefront of technologies for the industry, the study highlighted the Internet of Things, through its ability to track and monitor equipment and materials. Link

ME: The construction of the GCC railway network connecting Qatar to neighbouring Saudi Arabia will begin soon. The 2,177km long Gulf Railway is a proposed railway system that will connect all six of the GCC countries in Eastern Arabia. The project is expected to cost $250 billion, which will be shared by the six countries, in accordance with the length of the rail network in their territories. Link

Global: Construction materials costs in the US are up 17.5 percent year-over-year from 2020 to 2021. The US Census Bureau says that's the largest year-over-year increase in material costs since 1970. The increase is affecting everything from lumber, to concrete, to metal and hundreds of materials in between. Link; The construction materials shortage in the UK has been easing since the end of 2021, but the soaring cost of electricity and gas could lead to reduced sales and rising materials costs. Link

Asia: Shaken by a liquidity crunch among developers, China's property market is expected to stay soft in the first half of 2022 before rebounding later in the year as policies aimed at encouraging buyers helps sentiment recover. Average home prices are estimated to fall 1.0% on year in the first half, for the full year, home prices are expected to rise 2.0% according a Reuters survey of 17 analysts and economists. Link

Building materials & construction technologies

Australia: Australia aims to cut construction-related greenhouse gas emissions by making $212m available in debt financing to encourage the use of mass timber on big construction projects. The money comes from state investor, the Clean Finance Investment Corporation, which calculated that using engineered wood could cut buildings' embodied carbon by up to 75% compared to the use of conventional steel and concrete. Link

Global: The global market for Building Information Modelling (BIM) software will be worth US$21 billion by 2025, according to research data from Cambashi. Remote working trends resulting from the global pandemic, as well as government initiatives and regulations, are driving digital transformation in the construction industry. Link

USA: The White House announced it will establish a "Buy Clean" task force to focus on the production and purchase of low-carbon materials made in the U.S. for use in federal construction projects. The move comes after a December executive order meant to make the federal government more sustainable. The administration claims that the new policies will create more jobs and boost the country's competitiveness in the global market. Link

Europe: Key players in European steel market join SteelZero. B+M Steel, Eiffage Métal France, and Skanska UK will commit to specifying and stocking 100% net-zero-carbon steel by 2050 - this includes an interim commitment of using 50% responsibly produced steel by 2030. Link

USA: The National Aeronautics and Space Administration (NASA) has announced funding for the development of construction technologies to help humans live and work on the Moon. Three US universities will each receive US$2 million for research into the use of lunar resources for construction and advanced electronics that could continue to function in the extreme cold temperatures. Link

construction sector players

Europe: German contractor Hochtief has announced to buy remaining shares in Australia's largest construction concern Cimic. Currently, Hochtief owns 78.58% of Cimic and has offered A$22 per share for the remaining amount, in a final cash offer. Reuters notes that this amounts to US$715m. Link

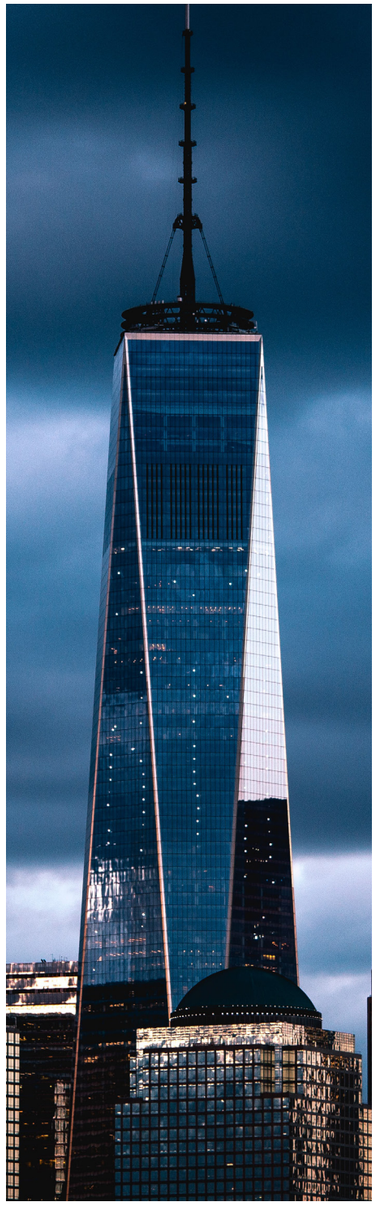
Europe: Ferrovial and Microsoft have agreed on a global alliance to advance digital solutions for the construction, infrastructure and mobility industries. The agreement includes the two companies working on the digitalisation of Ferrovial's operations, including process automation, frontline worker communications and project collaboration, AI technologies, and the development of zero trust cyber security models. Link

USA: Strong 2021 sales figures for Fluor - engineering construction company has announced revenue of US$12.4 billion in its financial results for 2021, with full year new awards at US$8.8 billion compared to US$7.5 billion a year ago. Company guidance for 2022 assumes increased opportunities for new awards across all segments and continued progress on its cost optimisation program. Link

USA: Top 10 contractor Tutor Perini reported profits of $29.3 million, or 57 cents a share, in the fourth quarter, down 17% from the year-ago period reflecting a slowdown in construction. Still, the weaker results beat Wall Street's average estimate of 51 cents per share, according to Seeking Alpha. Full-year profits totalled $91.9 million versus $108.4 million. Link

USA: Jacobs Engineering Group profit falls and backlog rises 12%. Company reported that profits in its first fiscal quarter tumbled almost 48% to $134 million, or $1.03 per share, and revenue was flat at $3.38 billion as declines in its U.S. operations outweighed gains overseas, particularly in Europe, Australia and New Zealand. Link

Australia: Lendlease calls 2022 a 'reset' year. Company lost $264 million in the first half of its fiscal 2022, ended Dec. 31, compared to a $196 million profit in the year-ago period, as the builder absorbed higher than expected restructuring charges and lingering impacts from COVID-19 on its development business. Link



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