Quantifying technology in real estate

CONTENTS

Foreword

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What if real estate isn't just housing the technology revolution, but enabling it?

For decades, property accommodated innovation. Now it actively shapes it. The relationship between technology and real estate has evolved, placing the built environment at the centre of progress. This edition of Quantifying Technology in Real Estate examines what that means for the spaces we build and the value they create.

Take data centres, the physical backbone of the digital world, expanding at record pace. Australia's rapid emergence as a leading APAC hub shows how growth follows the right conditions: land, reliable power and sustained infrastructure investment. Where these align, innovation takes root.

Clean technology follows similar logic. Solar power needs physical locations, yet across the UK, rooftops sit idle. These "grey spaces" could unlock new revenue while supplying the clean energy a net-zero economy requires. Real estate, in other words, lies at the heart of the green transition.

AI is reshaping how we occupy buildings. AI agents, working alongside human teams and beyond them, are transforming business operations and driving demand for computing power. Meanwhile, AI campuses are being developed - specialised real estate that brings infrastructure, talent and community together to accelerate commercial success and innovation.

Even quantum computing, ethereal as it sounds, is firmly rooted in the physical world. These machines need environments held at near-absolute-zero, shielded from vibration and noise. Breakthroughs in science and industry will depend on getting the property fundamentals right.

Technology and real estate are now inseparable. The places, power and infrastructure we build today will define where innovation happens - and how far it goes. The technology revolution, it turns out, is built on real estate.

Quantum computing

Quantum computing: a type of computing that uses the rules of quantum physics. Quantum bits, or qubits, can hold multiple possibilities at the same time, allowing the system to explore vast numbers of outcomes in parallel – giving quantum computers the potential to tackle much larger and more complex problems than conventional computers can manage.

$96
IBM currently charges $96 per minute for pay-as-you-go access to its quantum computer

$3.2bn
Investments in quantum computing reached $3.2bn in 2025 YTD 2025, a new record

34%
Prediction accuracy in bond trading boosted by up to 34% using quantum, when tested by HSBC and IBM

The quantum computing leap

A simple guide to quantum computing, exploring why 2025 is a turning point for the technology and the implications for real estate

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MONEY TALKS

Momentum in quantum computing is building. Billions in funding are flowing, and breakthroughs once thought decades away are starting to land. In June 2025, IBM unveiled Starling - the first machine announced with live error correction, long seen as the missing link between prototypes and real-world use.

Access to most quantum computers comes via the cloud. IBM currently charges $96 a minute with discounts for long-term commitments. Behind that virtual access lies extraordinary infrastructure - processors chilled to near absolute zero inside chandelier-like fridges. Such physical demands make real estate part of the equation.

WHAT IS A QUANTUM COMPUTER?

Classical computers run on bits - ones and zeroes - that drive everything from banking apps to Netflix. Quantum computers use quantum bits, or qubits.

The key difference is that while a bit is either zero or one, a qubit can be both at once. That strange property, drawn from quantum mechanics, lets quantum machines explore many possibilities simultaneously instead of one by one. Imagine trying every combination of a forgotten passcode at once rather than sequentially - that is their power. That capability could one day challenge today's digital security.

Three quantum effects make this possible: superposition (being

> **"Imagine trying every combination of a forgotten passcode at once rather than sequentially - that is their power."**

zero and one at once), entanglement (qubits linked so one instantly affects the other) and interference (boosting the right answers, cancelling the wrong ones). Specialised algorithms translate those quirks into useful results.

Companies create and manipulate qubits in different ways: IBM and Google use superconducting circuits, IonQ and Quantinuum trap atoms with lasers, PsiQuantum and Xanadu use particles of light.

But qubits are fragile and can be disturbed by heat, noise or vibration, crashing a calculation. To stabilise them, engineers use error correction - combining many raw physical qubits into one reliable "logical" qubit. Commercial-scale machines may need thousands of logical qubits, far beyond Starling's 200.

SIMULATION AND OPTIMISATION

Quantum's promise lies in two areas: simulation and optimisation.

Its deepest strength is simulation. Many of the systems we want to understand - from molecules in new drugs to the materials inside EV batteries - follow quantum rules. Classical computers can only approximate them and quickly run out of
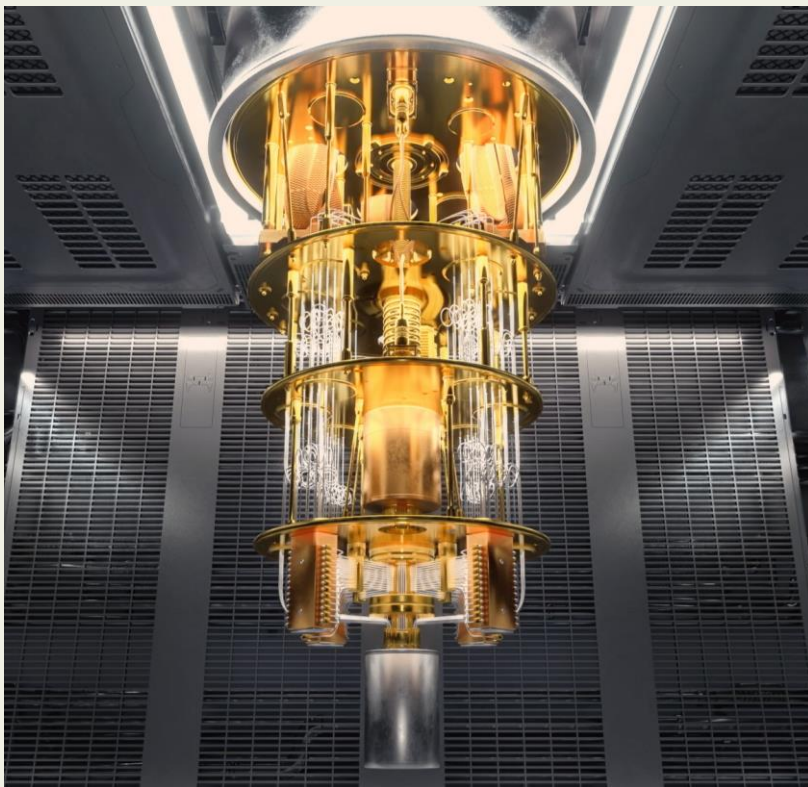
power. Quantum machines can model them directly.

Optimisation is the other frontier. Many decisions - from planning supply chains to choosing a building site - involve juggling millions of options. A quantum computer can evaluate those in parallel and highlight the most efficient solution. In real estate, that could mean weighing location, cost and regulation to identify the best site.

In practice, problems often mix simulation and optimisation. Drug discovery, for instance, means first simulating how a molecule behaves, then optimising for the version that works best in the body.

WHAT IT MEANS FOR REAL ESTATE

For now, demand is focused on the facilities that house the machines themselves. The needs vary by the type of qubit. Superconducting qubits depend on complex cooling and vibration isolation, while photonic approaches could one day fit into standard server racks. Over time, this may create a split between highly specialised labs and conventional data-centre environments.

These systems are energy-intensive, raising ESG questions around siting, low-carbon power and cooling. Developers may face the same scrutiny already applied to data centres: can facilities meet quantum's extreme technical requirements and sustainability standards at the same time?

Location also matters. Quantum firms cluster where universities, start-ups, corporates and government labs connect. IBM's hub in New York draws on Columbia University and the state's nanotech campus, while Quantinuum operates between Cambridge and Colorado - both renowned for quantum research and academic depth. Governments could influence where these clusters grow; the UK-US Tech Prosperity Deal, for example, signals interest in future growth zones for data centres,

Type of qubit	How it works	Companies using it	Strengths	Weaknesses	Real estate needs
Superconducting Circuits	Tiny electrical circuits cooled close to absolute zero and controlled with microwaves.	IBM, Google, Rigetti	Most advanced today; scaled to 100+ qubits.	Needs huge cryogenic cooling; very fragile.	Large labs with cryogenic "fridges," vibration isolation and shielding.
Trapped Ions	Individual atoms held in a vacuum and manipulated with lasers.	IonQ, Quantinuum	Very stable; long coherence times.	Hard to scale; requires complex laser setups.	Ultra-clean labs with vacuum chambers and precision laser systems.
Photonic Qubits	Uses particles of light (photons) guided through optical circuits.	PsiQuantum, Xanadu	Operates at room temperature; uses existing fibre-optic tech.	Entangling photons reliably is difficult.	Could be data centre compatible - potential to run in server racks with fibre.
Neutral Atoms	Neutral atoms arranged in grids using laser "optical tweezers."	QuEra, Pasqal	Can scale to hundreds of atoms.	Still experimental; requires ultra-cold conditions.	Specialist labs with ultra-cold equipment and highly stable environments.
Quantum Annealers	Purpose-built for optimisation rather than universal computing.	D-Wave	Already commercial; thousands of qubits.	Limited use cases.	Compact systems, smaller footprint, but still need cooling.
Topological Qubits	Exotic quasiparticles in special materials (still theoretical).	Microsoft (R&D)	Could be far more stable if achieved.	Not yet demonstrated.	Unknown - but could reduce cooling and space needs dramatically.

research campuses and innovation districts.

Ripple effects could follow from the industries adopting quantum. Early movers include banking, pharmaceuticals and automotive - sectors that already occupy significant real estate. As quantum shifts their R&D pipelines and supply chains, their space needs may change too.

AI, QUANTUM AND TIMELINES

Quantum divides opinion. Critics argue that AI already delivers results on cheap, mass-produced hardware. Some AI models are even reaching "chemical accuracy" in simulating molecules. Meanwhile, Meta's Mark Zuckerberg called it "quite a way off," while Nvidia's Jensen Huang put it "15-30 years away" - remarks that jolted stocks.

Yet progress is being made. Google's Willow chip has shown error rates falling as systems scale - a vital step toward fault-tolerant machines. IBM's Starling roadmap targets release by 2029. And despite Huang's caution, Nvidia has hedged its bets: opening a Boston research lab with leading universities, building AI-quantum tools and investing in PsiQuantum's record-breaking $1 billion round.

Increasingly, quantum and AI are seen as partners, not rivals. In the "Gen Q AI" vision, quantum generates scientific data that can train AI models to be faster, more accurate and more predictive.

2025: A Record Year for Quantum Deals
Private Funding into Quantum Computing (2014 - Dec 2025)
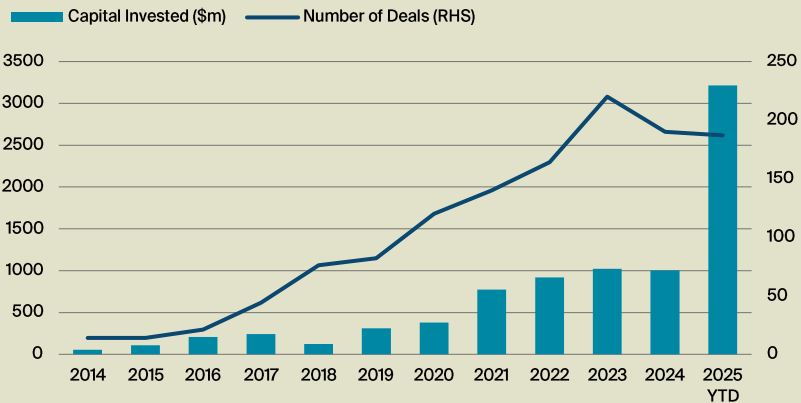
Source: Knight Frank Insight, Pitchbook

Forecasts on timelines vary: 5-10 years for specialised uses, 15-30 for universal machines. But the idea of quantum being "50 years away" is fading.

RECORD YEAR

Private capital is surging. According to PitchBook, investments in quantum computing reached $3.2 billion in 2025 year-to-date, which represents a new record. Noteable deals include PsiQuantum's $1 billion raise and Quantinuum's $600 million round at a $10 billion valuation, making it one of the most valuable quantum computing companies to date.

Governments are moving in parallel. Japan pledged more than $7 billion for chips and quantum, Spain launched its first €900 million national quantum

strategy and the US authorised fresh multi-year funding through the National Quantum Initiative. McKinsey estimates global public investment this year already exceeds $10 billion.

Geopolitics is part of the picture too. Quantum is now bundled into wider tech alliances such as the UK-US Tech Prosperity Deal, reflecting how governments see it as strategic alongside AI and nuclear.

Governments have reason to be involved: quantum technologies are both opportunity and risk. McKinsey estimates its economic value at $0.9-2 trillion by 2035. But a "Q-day" moment - when a computer becomes powerful enough to break current encryption - would destabilise global finance and security overnight. That is why billions are flowing not just into companies, but also into the labs, skills and infrastructure needed to keep innovation at home.

MOMENTUM IS BUILDING

Quantum computing is still early-stage, with modest revenues and few machines. Scaling up will require advances in both hardware and software. But the direction is clear: investment is rising, timelines are shortening and ecosystems are forming. For real estate, the question is not whether quantum will matter but how quickly it will reshape the market.

Quantum funding: public exceeds private investment
Funding into Quantum Computing (History to Dec 2025),
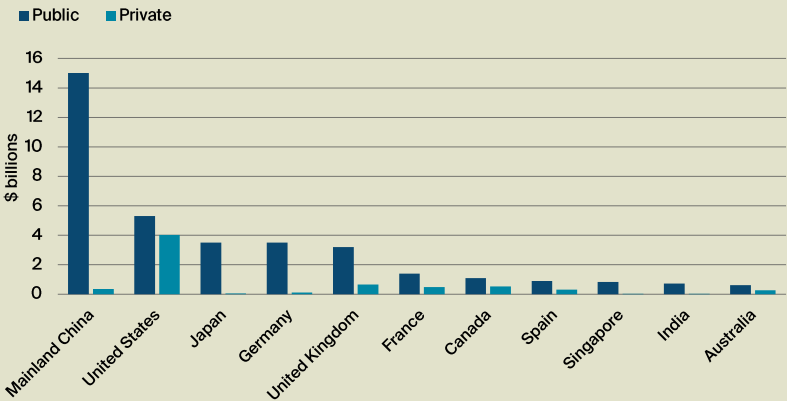
Source: Knight Frank Insight, Pitchbook

# A guide to real estate and quantum computing

KEY TAKEAWAYS FOR REAL ESTATE

- Quantum computers use quantum properties to solve complex problems far faster than classical machines.

- Their strength lies in simulation and optimisation.

- 2025 marks a turning point, with error correction breakthroughs and record private funding.

- What was once seen as half a century away now looks closer, yet useful machines are still years off.

- Real estate will feel the impact: demand for specialised labs and quantum-ready data centres, clustering around innovation hubs and shifting occupier needs.

CLASSICAL COMPUTING

0

Bit

1

QUANTUM COMPUTING

0

Qubit

1
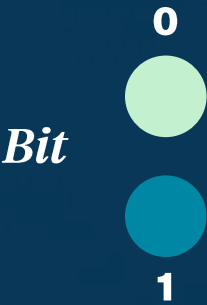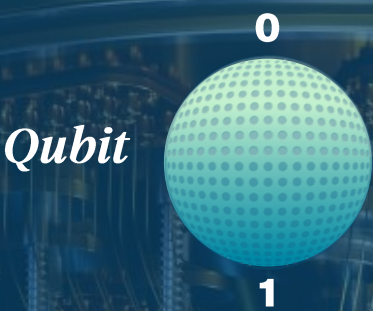
Quantum Computer	A quantum computer is a machine that uses the principles of quantum physics to process information in a fundamentally different way from classical computers
Bit	A bit is the smallest unit of information in a classical computer. It can take only one of two values, zero or one, much like a switch that is either off or on
Qubit	A quantum bit, or qubit, is the quantum equivalent of a bit. Whilst a bit is either zero or one, a qubit can be both at once, using quantum mechanics
Superposition	A quantum effect resulting in a qubit occupying zero and one at once
Entanglement	A quantum effect linking qubits, so one is directly connected to the other
Interference	A quantum effect boosting the right answers, and cancelling the wrong ones

WHO'S EXPERIMENTING?

- **AstraZeneca** is testing quantum chemistry via AWS and IonQ to speed up drug discovery

- **Mercedes-Benz and IBM** are simulating molecules for EV batteries that could charge faster and last longer

- **Airbus and BMW** ran a quantum challenge with TU Delft to design advanced materials that are strong yet weigh less, with potential use in future cars, planes and even buildings

- **ExxonMobil and IBM** are using quantum to optimise liquefied natural gas shipping routes, a problem with more possible outcomes than atoms in the universe

- **EDF and Pasqal** are trialling quantum algorithms to forecast renewable power and manage EV charging - helping to stabilise city energy grids

- **HSBC** and IBM tested quantum in bond trading, improving prediction accuracy by up to 34% compared with classical methods

Next-gen workplaces

Next-gen workplaces: a new era of work environments where technology supports adaptive, digitally driven work, with seamless human–AI collaboration and a shifting mix of tasks handled by automation. Technology acts as an active partner in decision-making and delivery, enabling more agile teams, faster learning and new forms of value creation.

$4.4tn
AI agents have the potential to unlock up to $4.4 trillion in additional value, on top of the value potential of traditional AI

300k hrs
BNY Mellon estimates their AI agents have eliminated 300,000 hours of manual work annually

30%
McKinsey estimate that it could automate up to 30% of work hours associated with consulting tasks by 2030

Digital employees, real impacts: Offices in the age of agentic AI

AUTHOR
MATT HAYES

This article is an extract from our Autumn 2025 (Y)OUR SPACE Digest, a seasonal review of key developments relating to the future of work and workspace.

Corporate automation is building momentum. Gartner predicts that at least 15% of day-to-day work decisions will be made autonomously through AI by 2028.[1] But this is not going to be achieved solely through run-of-the-mill ChatGPT prompts. The likes of AWS, Google, IBM and Salesforce are rolling out a new generation of AI tools known as agentic AI, or AI agents, designed to act like digital employees by executing day-to-day tasks across enterprise systems.

With market uncertainty and volatility putting pressure on bottom lines, this new wave of innovations could be a real game-changer. Indeed, McKinsey & Company estimates that this technology has the potential to unlock up to $4.4 trillion in additional value, on top of the value potential of traditional analytical AI.[2] For many senior decision-makers, investing in agentic AI could sound like a no-brainer. But what would such a step forward mean for workflows and workforces? And how would this impact decisions regarding office space?

AGENTIC AI: WHAT IS IT?
Agentic AI represents a significant evolution in artificial intelligence - systems capable not just of responding to instructions, but of independently pursuing complex goals, making decisions and interacting with digital environments on behalf of users. These tools combine large language models with planning and automation capabilities, enabling them to act with autonomy across enterprise systems.

Earlier generations of AI have been confined to narrow tasks. However, agentic AI can initiate, monitor, and complete workflows with minimal human intervention. As these systems mature, they are poised to change not just how work is done, but which kinds of work require a human presence at all.

REAL-WORLD IMPACTS: AUGMENTATION, PRODUCTIVITY AND EFFICIENCY
The productivity potential of agentic AI is already being demonstrated by a number of large enterprises. BNY Mellon, a leading global financial institution, has implemented "digital employees" equipped with logins and human managers.[3] These AI agents automate thousands of processes, from compliance checks to reconciliation tasks, at a scale and speed that human teams cannot match. The firm estimates that over 300,000 hours of manual work have been eliminated annually, freeing staff for more strategic activity. Crucially, BNY Mellon hasn't framed these systems as replacements, but as force multipliers that reduce bottlenecks and improve service delivery.

This model of augmentation rather than substitution will likely become a reference point for other organisations exploring the use of agentic AI. Other early-adopters across a variety of sectors are taking a similar approach to leveraging this technology. Recent examples include:

- Recruitment group Adecco, which has deployed a platform for AI-powered candidate screening, to help its agents deal with large volumes of applications in time-sensitive scenarios[4]

- Big Four consultancy Deloitte, which has rolled out agentic AI technologies for reviewing, drafting and proposing enhancements to documentation, to help its auditors meet client needs amid rising demand and increased complexity[5]

- US retailer Walmart, which is deploying agentic tools to streamline supplier onboarding, advertising and administrative tasks, along with a customer-facing AI agent, Sparky, to enhance its e-commerce experience, allowing users to reorder items and plan events, as well as providing recipe suggestions based on their grocery choices[6]

However, in other instances, the deployment of agentic AI appears to be helping organisations accelerate streamlining plans.

A key example is the aforementioned management consultancy, McKinsey & Company. Having deployed thousands of AI agents, and with the expansion of its proprietary platform Lilli, which is now used widely within the firm to support both internal and client-facing processes, McKinsey estimates that it could automate up to 30% of the work hours associated with consulting tasks by 2030.[7]

This tech strategy aligns with

the continued consolidation of the firm's workforce, as its headcount has fallen by around 5,000 since 2023.[8]

AI-INSPIRED REDUNDANCIES?

It appears that, among many market leaders, any potential workforce consolidation off the back of agentic AI deployment is yet to begin. Looking at the biggest names across financial services, professional services and recruitment (three industries that have been key early adopters of agentic AI solutions), data from LinkedIn Talent Insights suggests that most have expanded their global workforces over the past 12 months, as opposed to making efficiencies.[9] It appears that, at the moment, other factors are shaping their workforce planning.

WHAT THIS MEANS FOR REAL ESTATE

For real estate decision-makers, the implications are both disruptive and transformative. On one hand, the ability of agentic AI to perform complex roles previously handled by human workers could reduce certain occupiers' demand for physical office space in certain functions. This will particularly be the case for back-office roles and support services. On the other hand, as job roles shift to focus more on tasks less easily automated, such as oversight, analysis, and creative problem-solving, the nature of office use and occupier demand will continue to evolve along the trajectory established earlier in the decade amid the advent of Industry 4.0 and the paradigm-shifting pandemic.

Here are six considerations for aligning corporate real estate with the agentic AI era:

1. **Digital infrastructure:**
   Workplaces will need resilient digital infrastructure, robust connectivity and secure access protocols to support blended human–AI teams.

Back-up systems will be non-negotiable, and proximity to data centres will offer an edge in speed and bandwidth.

2. **Embedded tech:**
   Buildings must be ready for digitised workflows and hybrid collaboration. From desks to meeting rooms, every setting should enable seamless interaction between people, teams and AI.

3. **Dynamic workspaces**
   Flexibility and adaptability will be critical as agentic AI adoption reshapes teams, roles, processes and organisational structures.

4. **Talent and skills**
   Real estate will be a key strategic lever in the war for talent. Location, amenities and day-to-day experience will influence recruitment and retention, while versatile learning spaces will support reskilling and upskilling.

5. **AI centres of excellence**
   Dedicated AI hubs will act as catalysts for innovation. Locating them close to talent pools and academic and industry clusters will maximise both operational effectiveness and external collaboration.

6. **Agentic AI in real estate management**
   Deploying AI agents to oversee portfolio performance, lease data, and workplace utilisation will transform efficiency, enabling real-time decision-making and freeing CRE teams to focus on strategic value.

In conclusion, agentic AI will not simply trim headcount or turbocharge productivity. It will reorder how work is organised, which tasks belong to people, and where collaboration is most valuable. For corporate real estate, the challenge is neither to overstate automation's impact nor to ignore it.

Liam Cox, AI Workforce Specialist for Built Environment at Microsoft, explores how AI is moving from productivity tool to strategic partner in real estate

In my work at Microsoft with property and infrastructure organisations, I've seen a clear shift. Teams are no longer asking what Copilot is. They are starting to understand how foundational AI tools can genuinely improve how they work. Once those productivity gains are felt, the conversation quickly moves to bigger questions: how can AI reshape how we win work, serve clients, and run our businesses?

Looking ahead, I anticipate seeing AI agents used to generate tailored investment briefs based on live market data, monitor planning applications to flag development opportunities, or draft valuation reports using structured data and comparables. AI could also track occupancy trends and energy usage across portfolios, helping consultants proactively advise on consolidation or sustainability improvements.

AI is not a future concept. It is already delivering results. Property has always been about delivering value through expertise, relationships and market insight. AI does not change that mission. It enhances it.

The future of real estate will be shaped by hybrid teams, where professionals work alongside intelligent AI agents. Those who lean in now will be the ones setting the pace.

Evolving technology in real estate: from delivery to partnership

AUTHOR
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When I first started in IT, we programmed in a language called COBOL and hand-wrote our code on 132-column coding sheets. You didn't debate the design, you just transcribed it long-hand onto the coding sheets which were then typed into a mainframe that was orders of magnitude less powerful than your average iPhone. The system was built exactly to the specification, and the specification was written exactly to the stated requirements.

It was a linear process in that the business wrote the rules, and IT delivered the technology solution. IT was an order taker. Most firms thought about IT in much the same way - it was important, yes, but a peripheral function that implemented requests, kept systems alive, and worked to budget. Today that model is as dated as the coding sheets I once used. The real estate industry has changed and so has the role of IT. IT should no longer be thought of as a back-office function but as a partner in shaping strategy, creating new products and delivering measurable business outcomes. As our industry evolves, this shift in mindset requires us to reconsider not only how technology is delivered, but also how IT and the business collaborate to create value and drive innovation together.

IT AS A VALUE CREATOR

Historically, technology spend in real estate was justified through efficiency. Automation reduced headcount; centralised systems cut duplication; the cloud shrank infrastructure bills (at least in theory). IT was judged on cost savings rather than its ability to create business value. Today, the conversation is different. AI and other innovative tech can open up entirely new markets and investors and clients are willing to pay a premium for the insights these technology solutions can surface. Technology is no longer simply about reducing expense; it is about growing revenue and enabling products that would not otherwise exist.

FROM PROJECTS TO PRODUCTS

Real estate firms traditionally thought about technology in terms of projects: finite efforts to replace a CRM, the roll out a new finance platform, or updating a transaction management platform to support new regulations. These projects were requested by the business and executed by IT, often with little continuity once complete. Leading organisations are now moving to a model that focusses on log-lived teams delivering business outcomes. Instead of one-off projects, enduring teams are created around business value. These teams don't wait for instructions; they co-own outcomes with the business. In this model IT is not building what it is told but partnering to decide what should be built in the first place, creating new opportunities and value for our clients.

FROM CERTAINTY TO HYPOTHESES

Today, leading organisations recognise that uncertainty is inevitable and that progress comes from testing hypotheses, not from following rigid plans. Agile methods, rapid prototyping and a test-and-learn mindset enable businesses to explore new opportunities without the risk and cost of large, inflexible projects. While executives may be drawn to the illusory certainty of traditional project plans, IT's responsibility is to challenge this by demonstrating that the most effective way to manage uncertainty is through shorter, lower-cost and lower-risk iterations.

The most significant change is cultural. True partnership requires IT and business teams to share accountability for outcomes, with business leaders involving technologists early and technology teams focusing on client experience, commercial impact and risk. Without this shift, IT remains reactive and the organisation risks falling behind more integrated competitors.

The days of coding sheets may feel like a distant memory, yet the notion of IT as an order taker still persists in many organisations. For those willing to move beyond this outdated model, IT becomes a true business partner, deepening client trust and unlocking new revenue opportunities. The most successful real estate companies in the coming decade will not be those that simply deliver projects on time and on budget, but those that are willing to experiment and fully embed technology within their strategy. In this model, the line between "the business" and "the technology team" becomes blurred. IT is no longer just fulfilling requests; it is working alongside colleagues in lettings and asset management to design client propositions and shape the very direction of the business. IT is not merely a delivery function, it's a partner helping shape the very direction of the business.

Solar photovoltaics

Solar photovoltaics: often shortened to PV, or solar PV, technologies that turn sunlight straight into electricity. They use specially engineered materials that release electrical charges when exposed to light, producing power without moving parts or combustion.
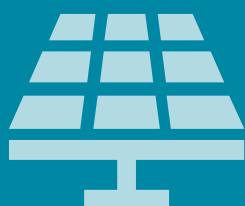
2.2TW
Global solar PV boast a staggering capacity exceeding 2.2 terawatts

£114k
A theoretical 3,400 sqm rooftop, 50% covered, could yield £114,000/year if energy is sold direct via PPA

>21%
Solar installed capacity in France grew more than 21% in 2024

The sunny side of tech: Solar's untapped potential

AUTHOR
FLORA HARLEY

More than 140 years after Charles Fritts' inventions, global solar photovoltaics (PV) boast a staggering capacity exceeding 2.2 terawatts (TW), as of 2024. The UK contributes around 1% of the global total, or some 19.6 gigawatts (GW), as of August 2025 (DESNZ). The solar rollout in the UK is accelerating at pace: 10% growth in the year to August 2025, with ongoing national support through the Clean Power 30 Action Plan, Solar Roadmap, and UK Industrial Strategy. In fact, 2025 surpassed 2024's solar electricity production by July, thanks to rising installations and sunnier conditions. At it's peak, solar met almost 40% of total electricity demand.

Yet the rooftop rollout is lagging. Just 5% of Great British buildings boast some solar, according to Ordnance Survey statistics. With domestic rooftops accounting for about 30% of capacity, there's a significant opportunity for commercial property owners to harness grey space - roofs and car parks - for solar generation. Here, we explore potential benefits, as well as recognising some of the constraining factors, and spotlight the car park potential.

The potential benefits

Liquidity for asset owners
Our ESG Property Investor Survey highlights that 29% of investors assess and/or require renewable energy provisions for new acquisitions. In a sample of UK REITs, almost all report on electricity generated and the proportion of electricity supplied through renewable sources.

Tenant demand
Occupiers increasingly report on the proportion of electricity coming from renewable sources.

Emissions reductions
In the hierarchy of energy procurement, on-site is prioritised due to transmission factors. For occupiers and owners there are opportunities to cut Scope 1/2 and Scope 3 emissions through local, traceable supply.

Income potential
Our research highlights a theoretical 3,400 sqm rooftop, 50% covered (955 kWp), could yield £114,000/year if energy is sold direct via PPA, or £10,000 if exported to the grid; actual value depends on usage and deal structure.

Cost savings and volatility
That same 955 kWp rooftop would typically generate 0.9 GWh/year. With average Q2 2025 small/medium non-domestic electricity prices at 27p/kWh, that's nearly £245,000 annual value in energy costs: PPAs can deliver long-term price stability and reduce cost volatility.

Energy security
Adding batteries can reduce reliance on grid supply which is increasingly valuable in constrained areas or sites where connection is limited.

Social aspects
Rooftop and group solar models can support community or co-operative energy, fostering inclusion, local engagement and shared benefits.

Carpark canopies
Solar canopies support the EV charging network, generating revenue via direct offtake and extra dwell time. For users, canopies provide shade or weather protection, with retailers and offices benefitting from increased site attractiveness. They also now benefit from permitted development rights.

What's stopping it?

Roof condition, position and material
The ideal UK roof for solar is south-facing, unshaded, 30–40° pitch, slate or tile, and free from roof plant equipment. In reality, asset-specific attributes need to be assessed. For example, roofs may require remedial works, or when energy consumption is high, covering north-facing roofs is also viable.

Lease complexities
Full Repair and Insurance (FRI) leases, standard in industrial/logistics, limit what tenants and landlords can do which can serve as a blocker unless potentially costly renegotiations clarify rights and responsibilities. The UK Solar Roadmap highlights a key action area as the need to standardise and provide frameworks to overcome this; in addition, the UK Warehousing Association Solar Toolkit can be used as a guide.

Capital expenditure
The average installed cost for solar panels has dropped to around £650–£1,200 per kW (monocrystalline), depending on size and roof pitch. However, there are additional costs such as potential roof repairs as well as legal, and consultancy fees. Batteries are increasingly considered for flexibility but remain expensive, on average £7,000 for a 10kWh system, though prices are following a similar trajectory to solar. In addition, zero capex business models are developing.

Grid connection
Larger rooftop and car park schemes may need grid upgrades, which are slow and can require significant investment, although reforms are underway to address longstanding bottlenecks.

PARKING POWER: SOLAR CANOPIES

The government is actively considering mandatory canopies for new/existing car parks and launched a call for evidence in summer. Our 2023 research A New SPV – Solar Power Value identified this as an untapped opportunity with 12 GW potential across all car parks over 2,000 sqm (an estimated 80 spaces is the law in France). Permitted development rights were expanded in late 2023, easing planning for canopies and above-1MW rooftops.

The UK is looking to France (and a few other European locations), which mandated from July 2023 (but first introduced in early 2022) that car parks with over 80 spaces install solar canopies covering at least 50% of the area within the next six years, while those with 400 spaces or more have a three-year deadline. Solar installed capacity in France grew more than 21% in 2024, hitting 24 GW, according to SDES, with 6% 'self-consumed' production, an indicator of how distributed generation models are rising in importance.

This remains a massive untapped opportunity. For UK property owners, solar canopies can generate revenue via direct offtake (through export to the grid or private wire), lower operational costs through covering energy demand and indirectly through extra dwell time for retailers or attractiveness for property users. Whether challenged by roof suitability or lease complexity, or simply due to presence, it is worth examining car park options for solar deployment.

GREY IS THE NEW GREEN

The UK is witnessing a solar surge, setting new records for generation and installed capacity in 2025, yet the vast potential of grey space - rooftops and car parks - remains untapped. Property owners face both emerging incentives and persistent practical obstacles, but market momentum and policy support are unlocking new routes for solar deployment, backed by innovation and growing demand, meaning opportunities and feasibility are ever more important to explore.

Transformative innovation

ZERO CAPEX SOLUTIONS

New business models, such as Atrato, allow owners to host solar with no upfront cost; these third parties own and operate the system, selling discounted electricity on-site.
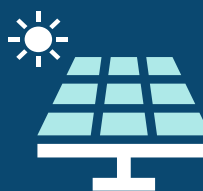
ADVANCED SOLAR TECH

Innovations include lighter panels, 'sticker' panels reducing roof load, ultra-efficient perovskite (Such as Oxford PV's most efficient solar panel), transparent and two-sided panels, and solar "skins."

LONGER LIFETIME

Some modern panels are proving to be 80% effective after 30 years, beyond the 20–25-year financial modelling standard.

CORPORATE POWER PURCHASE AGREEMENTS

As we explore here and here, where on-site is not an option, there is a growing market for CPPAs to meet the 'additionality' element of renewable energy generation.

AI-centric developments

AI-centric developments: purpose-built places designed to support working with AI. From collaborative AI campuses that foster innovation and talent, to data centres increasingly engineered with AI in mind, these environments combine high-performance computing infrastructure, resilient power, and specialised workspaces to support intensive digital workload.
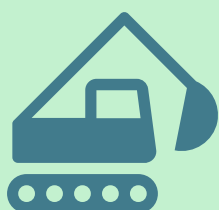
$250m
A new $250 million AI research centre is being built with 3 MW of cutting-edge GPU capacity in Montreal

500
There are now nearly 500 AI unicorns – private companies valued at over $1bn

8.5GW
Australia's live IT capacity is expected to grow to over 8.5GW when considering projects in the pipeline

Nurturing the AI wave

A global survey of eleven 'AI campus' developments yields seven themes, forming a practical playbook for creating spaces and places that attract AI firms.
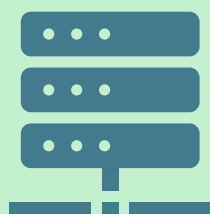
AUTHOR
JENNIFER TOWNSEND

Eleven AI-related developments examined

A new breed of AI-focused development is emerging. Specialised real estate is being developed to attract the full spectrum of AI players and, crucially, the talent that powers them.

Despite some commonalities, these are far from standard offices or business parks. They combine high-performance computational infrastructure, resilient energy and power, targeted amenities and specialised spaces, operational support, and curated communities to accelerate innovation and commercial success.

To deepen our understanding of the distinctive attributes, we analysed eleven AI-centric developments globally. The analysis yields seven defining themes:

1. **Building design and specification** prioritise resilient power, cooling, and computational infrastructure, complemented by flexible layouts, specialised facilities and educational space. Spaces and places champion wellbeing, productivity, collaboration and inspire.

2. **Effective location choices** hinge on proximity to talent, funding, peer networks, infrastructure, data and connectivity. Government policy tilts the playing field. Some ecosystems coalesce around anchor institutions, others start from scratch.

3. **Rich amenities** support productivity and help attract and retain talent, with upskilling, convenience, experience and wellbeing prioritised.

4. **Active placemaking and events** create vibrant innovation communities that are connected to the public.

5. **Curated tenant mix and anchor institutions** (like universities or big tech labs) attract others. In some cases, this includes not just AI companies but also adjacent industries and suppliers.

6. **Tailored operational models** (such as not-for-profit or membership-based hubs, funding opportunities, access to mentorship services, educational programmes) deliver crucial support that drives commercial success.

7. **Strong government policy, governance, and incentives** often underpin success.

1. Building Design and Specification

Modern AI hubs are engineered from the ground up to support compute-intensive work. These developments feature enhanced power supply, cooling, connectivity and other computational infrastructure. Many campuses incorporate micro data centres, supercomputing resources, 24/7 backup power and high security for sensitive data. Immerso AI Park in India features an AI cloud data centre on site. In Montreal, a new $250 million AI research centre is being built with 3 MW of cutting-edge GPU capacity and immersion cooling to support model training at scale. ZGC (Jingxi) AI Technology Park in Beijing includes an on-site AI supercomputing power centre to support model training and testing, bringing computational capability physically closer to researchers.

Design aesthetics matter too. The Merantix AI Campus in Berlin repurposed an industrial site into a sleek workspace with exposed concrete, glass and abundant natural light, creating a setting that is both functional and aspirational. The offices of the world's largest AI companies offer useful cues on design. OpenAI's San Francisco headquarters integrates a library as a quiet knowledge hub, an indoor "walk in the park" that brings nature inside and promotes wellbeing and an event space with a large projection screen for demos and talks. Part of the building has been converted from light manufacturing to an arts activity space with a gallery, recording studio and demo hall, encouraging the interplay between technology, art and public engagement.

Specialised labs, maker/prototyping facilities, small-scale manufacturing, showcase and education spaces and test-bed environments are increasingly common. Merantix built a "Hacker Room" with high-end workstations for ML engineers to experiment at the hardware level. Shanghai's Zhangjiang AI Island was conceived as a demonstrator for AI at city scale, set up to host live trials of dozens of applications. Specialised spaces can also be specific to target industries, for example, an Immerso AI Park in Malaysia includes an AI movie studio.

Flexibility is fundamental across these schemes. Accelerator and incubator space sits alongside major corporate facilities, with leasing models that accommodate companies of every size and stage. Structural capacity, extra risers for cabling and generous ceiling voids are built in to anticipate future hardware.

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2. Effective location choices

Location is a strategic choice, balancing access to talent, partners, funding, government support and quality of life/cost of living amongst other factors. Many hubs position themselves inside existing innovation districts or academic centres. The Dubai AI campus leverages a prime central location in the Dubai International Finance Centre, meaning AI firms literally co-locate with global banks, VCs and multinational corporates in Dubai's financial heart. The DIFC setting also ensures excellent physical connectivity, while being inside an established business district means the AI Campus can plug into a rich professional network.

Other projects aim to build clusters from scratch, often via public-private partnerships. MBZUAI was placed in Masdar City, Abu Dhabi's master-planned sustainable tech district, creating a clean sheet AI ecosystem with university gravity at the core. In India, the forthcoming Immerso AI Park is being established at GIFT City in Gujarat, a high-tech enclave with special economic zone incentives and modern infrastructure that signal world-class operating conditions.

In Asia Pacific, governments are literally building entire AI towns. Shanghai's Zhangjiang Science City has unveiled a 2 km² "AI Innovation Town" aimed at housing 1,000 AI companies by 2030. The development integrates not only offices and R&D labs but also residences, parks and conference halls to create an all - in-one ecosystem.

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3. Rich amenities

AI campuses differentiate through amenities that directly support innovation. This includes podcast studios and media labs. AI AM in Amsterdam offers a fully equipped recording studio and a separate voiceover booth, enabling teams to produce demos and educational content without leaving the building.

Given the long hours and deep focus involved in research as well as the need for companies to attract and retain top talent, lifestyle amenities are thoughtfully curated with wellbeing, experience and convenience in mind. Merantix Campus includes an on-site café

and shared kitchen that double as informal collaboration zones. Quiet rooms and phone booths recognise the need for concentration and confidentiality. Auditoriums and classrooms are common, bridging the gap between work, learning and outreach. In San Francisco, where developers compete for AI tenants, amenity offerings have escalated, with wellness suites, speakeasies, outdoor terraces, libraries, auditoriums and specialist studios all in play.

4. Active placemaking and events

Vibrant communities do not emerge by accident. These hubs invest in placemaking and programming. The London AI Hub hosts more than 100 events annually, ranging from technical workshops and founders' talks to investor breakfasts. Berlin's Merantix Campus is similarly event rich, clocking 200–300 events per year by its third year.

Placemaking goes beyond formal events. These campuses cultivate informal social life to bind the community. Many have weekly happy hours, demo days or even family-friendly gatherings. Tenant lounges and rooftop terraces (like the one in London's AI hub) are intentionally designed for chance encounters. Placemaking also extends to art and the environment. Some sites feature AI-inspired art installations or interactive displays in common areas, subtly reinforcing a shared identity. Heilbronn's IPAI plans to include civic spaces as part of its innovation park concept, inviting the public for exhibitions and thus demystifying AI for the community at large. This

openness helps placate fears about AI by involving people in the dialogue.

5. Curated tenant mix and anchor institutions

Successful developments curate a tenant mix anchored by institutions that lend credibility and pull. A typical recipe blends start-ups and scale-ups, corporate labs, investors and academic partners alongside suppliers. Start-ups bring agility, corporates bring resources and real-world problems, universities supply talent, training and fundamental research, while investors and accelerators add capital and guidance. Anchors function as magnets. At MBZUAI, the university itself anchors the ecosystem, attracting firms such as IBM and Microsoft. Dubai's AI campus is built around heavyweight partnerships. Amazon Web Services, HP, Microsoft, Oracle and Nvidia supply the hardware, cloud capacity, and know-how that fledgling firms usually struggle to secure. The result is a ready-made tool kit.

6. Tailored operational models

The best operators behave as partners rather than landlords, providing a crucial layer of operational support to enable success. At ZGC (Jingxi) in Beijing,

municipal developers have established dedicated industry funds to back resident firms, coupling finance with incubation and acceleration services. Practical support ranges from mentorship and regulatory advice to introductions across supply chains, training programmes and handling recruitment drives. Compute is treated as a managed service in some locations, with on-site specialists who help optimise workloads or coordinate bulk GPU procurement. The Merantix AI campus offers in-house educational programmes through the Merantix AI school, an executive education initiative that partners with academic institutions like ESMT Berlin and the Hasso Plattner Institute.

7. Strong government policy, governance and incentives

AI has become a geopolitical priority, and policy is often the tailwind that determines momentum. The UAE's National Strategy for AI 2031 underwrites MBZUAI and complementary visa policies that attract global talent. In Germany, state-led competitions and early funding have de-risked projects like IPAI in Heilbronn. China illustrates how deeply real estate can be integrated into AI industrial strategy, with designated AI pilot zones, seed funds and talent programmes bundled with land allocation and planning flexibility.

Crucially, governments often invest in the enabling backbone that many private developers cannot deliver alone, such as power grid upgrades, renewable energy integration and district cooling.

Six takeaways for Landlords and Developers

Prioritise infrastructure for compute-intensive work, then layer in specialised labs, test beds and showcase space within flexible, human-centred layouts and inspiring design features. Offer a range of spaces to accommodate start-ups and large corporates.

Programme an open, high-tempo community that connects industry to the wider public and curate the tenant mix.

Differentiate through amenities that directly support innovation, education, wellbeing, experience and convenience.

Location is key. Benchmark metrics such as talent availability, research intensity, government policy, infrastructure strength, cost of living and quality of life and industry clustering to pinpoint the optimal site. With the right partners it is also possible to build a cluster from the ground up.
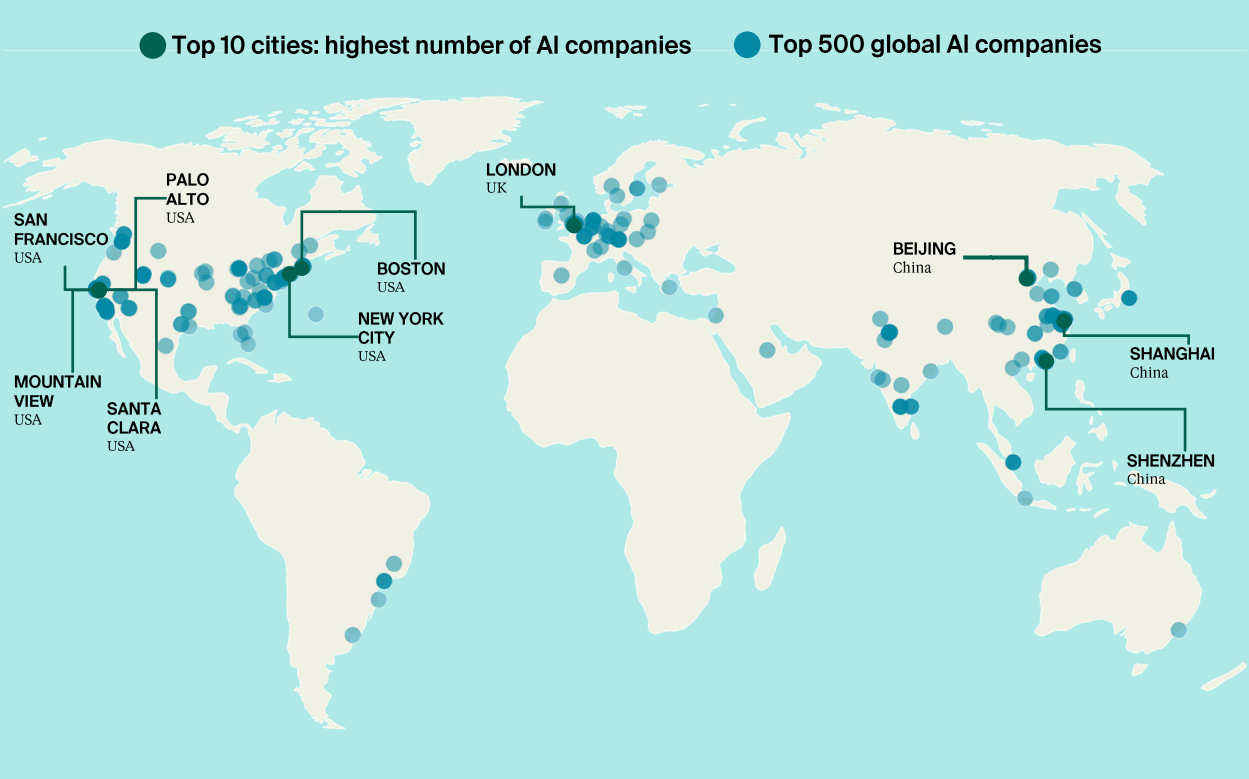
Operate as a partner, providing that crucial layer of operational support and strong governance.

Align with government policy and incentives to unlock planning, land, infrastructure, talent flows and broader incentives.

Global AI factsheet

Current growth metrics and geographic hotspots

● Top 10 cities: highest number of AI companies   ● Top 500 global AI companies

SAN FRANCISCO USA
PALO ALTO USA
MOUNTAIN VIEW USA
SANTA CLARA USA
BOSTON USA
NEW YORK CITY USA
LONDON UK
BEIJING China
SHANGHAI China
SHENZHEN China

500

SOARING VALUATIONS: There are nearly 500 AI unicorns and over 1,000 AI companies with a valuation of $100 million plus.

Source: CBInsights, as at Aug 2025. Unicorns are private companies valued at over $1bn.

100

RAPID GROWTH: 100 of these unicorns were founded in 2023 or later.

Source: CBInsights, as at Aug 2025. Unicorns are private companies valued at over $1bn

99%

SMEs DOMINATE: 99% of AI companies formed in 2020 employ less then 250 people. 94% of companies formed in 2015 employ less than 250 people.

Source: PitchBook, using their sector classifications, based on companies where headcount data is available.

50%

RECORD LEVELS OF FUNDING: The AI sector accounted for over 50% of global VC funding so far this year. This compares to 7.8% in 2015. $45bn went to AI start-ups in Q3 2025 alone.

Source: PitchBook, using their sector classifications

Top ten countries – government AI action

1. SAUDI ARABIA
2. USA
3. CANADA
4. SOUTH KOREA
5. CHINA
6. SPAIN
7. UK
8. GERMANY
9. FRANCE
10. SINGAPORE

Source: Tortoise AI index. Government strategy gauges the depth of commitment from national governments to AI, investigating spending commitments and national strategies.

Innovation is not optional

AUTHOR
MAX BEARD, KNIGHT FRANK INNOVATION ARCHITECT

Innovation is not optional; it is an obligation; we owe it to ourselves.

October's Nobel Prize in Economic Sciences was won by three gentlemen – amongst them, Joel Mokyr, who has shown that sustained economic growth is driven by innovation; science and technology evolving together, combining high levels of mechanical competence and a society willing and open to change. The other two winners, Philippe Aghion and Peter Howitt, also showed how the "creative destruction" of established companies by new products and processes is a key driver of growth. All three of their conclusions suggest that the level of embedded innovation directly correlates with whether you live in a growing or stagnating economy.

William Hague recently wrote, "In Britain and the rest of Europe, while governments have many initiatives that support innovation, much of their activity fails to give it sufficient priority and most of their policies actively stifle it. That is why they are stuck in stagnation and running out of money." He's right, the government often inflict a cryogenic economic freeze,

whilst we wait for the outcome of an event, the budget, for example, stifling innovation and investment in its wake.

We have to do better. The scale of the problem is large - the number of European companies in the world's top 100 has fallen from 41 in 2000 to just 18 today, and we're yet to spawn a $100 billion business.

> **"Hopefully, with £800 million in funding over the next few years, ARIA and its subsequent research programmes may hold the key to growth in the UK. "**

Most importantly, all is not lost! ARIA (The Advanced Research and Invention Agency), launched in Britain in 2023, could hold the key. Its mission statement is comparable to the Defense Advanced Research Projects Agency. 'DARPA' holds GPS, stealth aircraft and the internet amongst its proudest

achievements. Hopefully, with £800 million in funding over the next few years, ARIA and its subsequent research programmes may hold the key to growth in the UK.

On the venture capital side, the signal is also strong. Programmes like 'Project Europe', led by Harry Stebbings at 20VC, aim to invest in and mentor young European Founders under 25, backing the latest and greatest ideas. The fund has an initial size of €10 million and will invest approximately €200,000 per founder and connect founders with their network.

Back to property, capital will increasingly flow to jurisdictions and assets that embed innovation and adaptability. Innovating means converting property assets into data-rich platforms, enabling flexibility, repurposing, faster turnaround, lower cost of ownership and better user experience.

Innovation is not optional; it is an obligation. We need it to deliver better growth for our economies to stay competitive, to our property and infrastructure systems to adapt and thrive.

More ideas, please!

Powering the Pacific: Australia's data centre revolution

AUTHOR
LAURENCE PANOZZO, KNIGHT FRANK AUSTRALIA

Australia is emerging as one of the world's newest adopters of data centres, with local institutions beginning to leverage key advantages over other countries and consequently outpacing many of its Asia-Pacific (APAC) peers.

The country boasts a robust, resilient economy and the fastest population growth amongst the world's most developed countries. Internet penetration is among the highest globally, with 97% of residents in Sydney and Melbourne online. Australia also offers a competitive cost base, reliable power supply, and continued infrastructure investment. It will also continue to benefit as a choice location for US investment in data centre development due to its geopolitical stability, strong alliance, reliable connectivity, and cost advantages driven by a weaker currency.

These distinct advantages have fast-tracked Australia into the largest market for data centres in APAC in terms of aggregate supply. There are currently 1.4GW of live IT capacity, and this is expected to grow to over 8.5GW when considering projects in the pipeline. Within Australia, most data centres are concentrated in Sydney, which has 57% of the country's live IT capacity, followed by Melbourne with 27%.

Sydney has typically been the chosen hub for data centres in Australia, but Melbourne is gaining ground as a preferred location for new developments, driven by fewer constraints on land and power. All major US cloud providers (AWS, Microsoft, Google, and Oracle) now have dedicated centres in Melbourne.

Melbourne's live IT capacity has risen 24.6% year-on-year, with 362.8MW now operational as at Q3 2025 compared to Sydney, which has grown 11.5% over the same period. Despite stronger growth in Melbourne, Sydney is still a significantly larger market with 781.4MW operational, more than double Melbourne.

Furthermore, the pipeline for new space is stronger in Sydney with just over 1.3GW in the pipeline compared to almost 1.1GW in Melbourne. The vacancy rate in both cities is exceptionally low, sitting at 4.3% in Melbourne, and 4.6% in Sydney, underpinning the strong demand for data centres in Australia.

Supply development in APAC countries

MW

Legend: Live, Under Construction, Committed, Early Stage
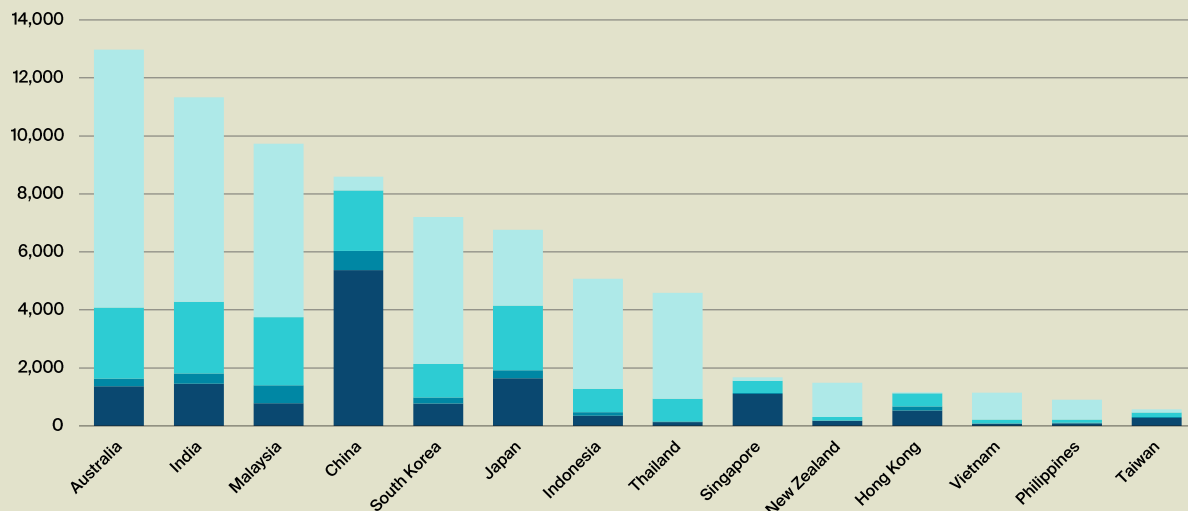
Source: Knight Frank Insight

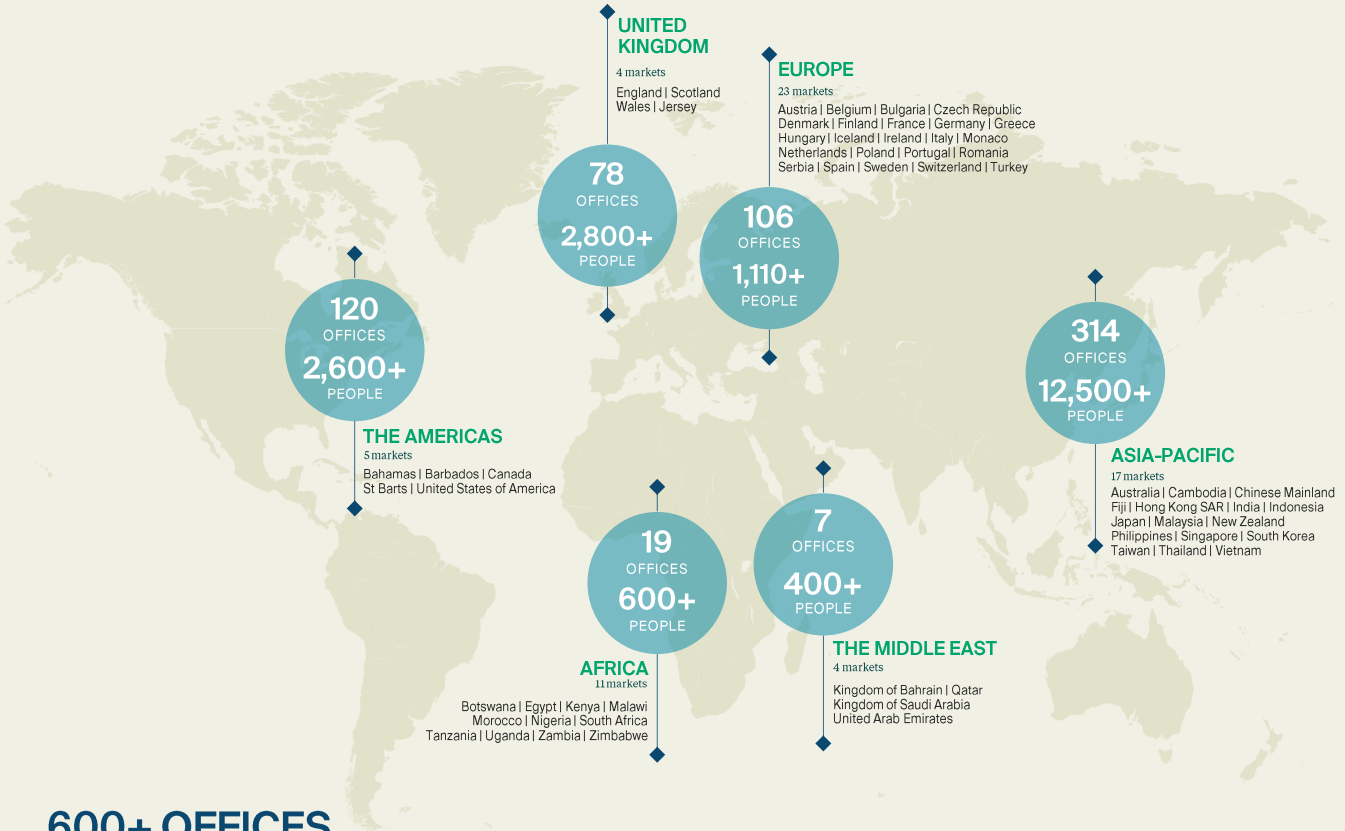While Sydney remains larger overall, limited land availability and rising costs hinder AI-focused expansion, making Melbourne's scalable infrastructure and proximity to renewables more attractive for next-gen digital infrastructure.

Whilst data centre take-up has grown markedly, there is concern in Australia over energy consumption, particularly considering the federal government's goal to reduce carbon emissions markedly by 2035. In response to this issue, many data centre companies such as Amazon, Google and Meta are increasingly investing in renewable energy projects to meet their substantial power demands. These investments could not only spur innovation in renewables but also contribute excess energy back to the grid. Australia holds a strategic advantage in the transition to renewable energy, with abundant yet underutilised solar and wind resources. The data centre revolution can help Australia capitalise on these advantages by bringing further new investment forward in renewables and improving the infrastructure to deliver this power to the major cities, which will encourage additional innovations and efficiencies. This partnership is important as these concerns will be addressed by the Department of Science, which is tasked with clearly defining Australia's data centre strategy in the forthcoming months. The government is on record as saying that issues relating to energy will take precedence over advancements in data centres. Their primary considerations are job creation, economic growth, national security, clarifying the role of public investment, and most importantly, energy consumption and sustainability.

Strategic and disciplined planning will be key to the industry's future success, and it is hoped that Australia continues to build on its existing advantages in this space.

Our global network

Knight Frank

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4 markets
England | Scotland
Wales | Jersey

78 OFFICES
2,800+ PEOPLE

EUROPE
23 markets
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Denmark | Finland | France | Germany | Greece
Hungary | Iceland | Ireland | Italy | Monaco
Netherlands | Poland | Portugal | Romania
Serbia | Spain | Sweden | Switzerland | Turkey

106 OFFICES
1,110+ PEOPLE

120 OFFICES
2,600+ PEOPLE

THE AMERICAS
5 markets
Bahamas | Barbados | Canada
St Barts | United States of America

314 OFFICES
12,500+ PEOPLE

ASIA-PACIFIC
17 markets
Australia | Cambodia | Chinese Mainland
Fiji | Hong Kong SAR | India | Indonesia
Japan | Malaysia | New Zealand
Philippines | Singapore | South Korea
Taiwan | Thailand | Vietnam

19 OFFICES
600+ PEOPLE

7 OFFICES
400+ PEOPLE

AFRICA
11 markets
Botswana | Egypt | Kenya | Malawi
Morocco | Nigeria | South Africa
Tanzania | Uganda | Zambia | Zimbabwe

THE MIDDLE EAST
4 markets
Kingdom of Bahrain | Qatar
Kingdom of Saudi Arabia
United Arab Emirates

600+ OFFICES
OVER 50 TERRITORIES
20,000+ PEOPLE
1 GLOBAL NETWORK

As of July 2025

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